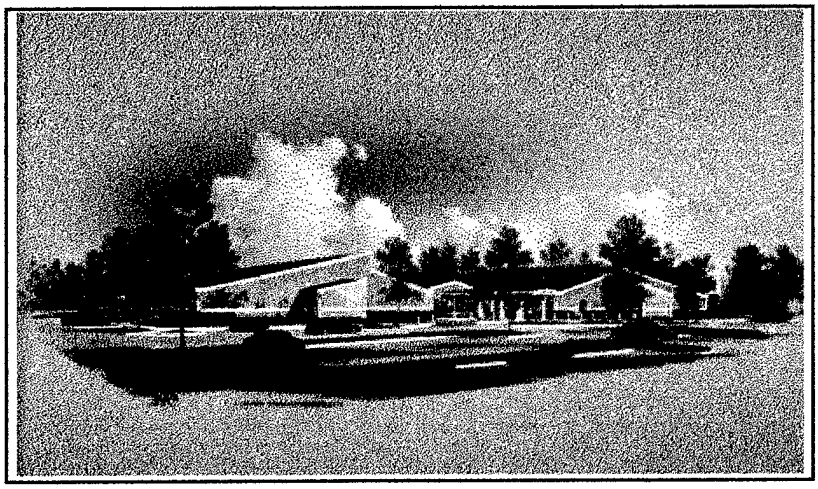
U.S. Army-Baylor University Graduate Program in Health Care Administration

Staffing Structure for the Joel Health/Dental Clinic

(Picture from Architectural Drawings)



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ABSTRACT

As the system of health care evolves into managed care, organizations need to provide primary care to capitated populations in the most cost efficient yet effective manner. Critical to the success of the system is matching beneficiary demand with provider service supply in a competitive structure. This research study investigated the potential demand of beneficiaries projected to be enrolled at one primary care enrollment site at Ft. Bragg, N.C. under the TRICARE system of military managed medical care. Historical military and civilian data were analyzed and the potential primary care visits for the year were projected. The supply issues focused on the number of patients the providers could treat per hour, hour availability, provider mix and support staff in projecting the number of visits which could be accommodated. Again, historical military and civilian data were researched. This data was developed into a spreadsheet template for varying beneficiary demand and provider productivity to evaluate different staffing structures and the resulting panel size (number of beneficiaries enrolled per primary care provider). Suggestions for increasing panel size and subsequently financial payment under a capitated system were examined. Thus, through addressing demand and supply interactions and interventions, health care planners at Ft. Bragg can determine the most competitive staffing structure for this primary care clinic.

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CHAPTER 1

INTRODUCTION

Conditions Which Prompted the Study

The entire health care system at Ft. Bragg, NC is in a period of dynamic change, necessitating redesign and reengineering initiatives in response to several internal and external challenges. In the following a description of the external and internal forces constituting these changes are explained and the foundation laid for explaining why this study is being conducted.

Approximately 163,600 beneficiaries receive primary, secondary and tertiary care through Womack Army Medical Center's (WAMC) system of care. The current 203 bed inpatient facility is complimented by a variety of outpatient clinics to include eleven primary care clinics. By the year 1998, a new 287 bed facility replacing the current medical center will open, mergers of the eleven outpatient clinics into five comprehensive, family practice enrollment sites will occur, and the TRICARE system of managed care will be initiated. These changes are occurring during a period of severe budget cuts necessitating the military system to become more efficient, effective and competitive with our civilian counterparts. They represent tremendous opportunities for reorganizing the provision of health care into a comprehensive, managed care system yet simultaneously present numerous threats which, if not properly addressed, could lead to the health care system's failure.

Effective in fiscal year 1998, the medical center commander will receive a capitated fee for each beneficiary enrolled at one of his[1] health care sites. Thus, it is crucial for the commander to implement a system of health care which is cost-effective yet comprehensive in nature, addressing all the health care needs of the enrolled population while simultaneously being competitive with the local civilian health care industry. In response to the need to implement a managed system of primary care to a select group of enrolled beneficiaries, two new clinics will be constructed at Ft. Bragg and the mission of three other clinics will change. These sites will serve in a health maintenance organization (HMO) role, providing the preventive and wellness care necessitated by the TRICARE contract while also providing illness care.

As indicated previously, this opportunity to change our philosophy of care for WAMC's beneficiaries into a managed care, comprehensive approach is laden with potential problems. In the current system, WAMC patients can receive outpatient care through various troop and/or family clinics, the emergency department or the CHAMPUS system. For example, if a client is unable to obtain care at one of the outlying clinics, he can come to the hospital's outpatient clinic or the emergency department (the emergency department cares for approximately 160 patients a day, of which the majority are non-emergent, primary care in nature). This approach equates to a fractured system in which specialized services are abused. Complicating this issue is the fact that the data collection methods for these different outpatient sites vary. Thus, an analysis of the total current demand for health care of a set group of patients for planning purposes is difficult, if not impossible, to obtain. This demand data, combined with

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[1]NOTE: The use of his or he refers to both sexes

requirements for preventive services under TRICARE (the military's managed care system of health care), represents the health care services which have to be provided to an enrolled group of beneficiaries. This data, currently not totally available, is the foundation for adequate staffing patterns. The current standard of enrollees per provider used by the government's contracting system may not accurately reflect the demand of Ft. Bragg's population and, if used for planning purposes, may lead to inadequate planning, causing unmet demand or inappropriate utilization of resources. And finally, as reflected in Pallarito's article (1996) addressing service consolidation, only 7% of hospital employees know about and understand managed care. Do our providers truly understand the demands of serving a capitated population and their required responses to these demands? Supply, demand and system data is critically needed for adequate planning purposes.

The Joel Health/Dental Clinic ("COSCOM Family Practice Clinic") (JHD clinic) is due to open in the summer of 1998 and represents a merger for health care of Troop Medical Clinics (TMCs) 21 and 22 into a capitated managed care arrangement. Currently, the anticipated enrolled target population seeks medical care at these TMCs, the emergency department, the Primus clinic, the outpatient clinic and through the CHAMPUS system. Thus, due to this fragmentation of care, the actual demand of the enrolled population based on historical data from these sites is difficult to assess and subsequently has not been determined. In addition, the TRICARE contract includes mandatory health promotion visits which must be addressed by the JHD clinic. These visits need to be included in the calculated demand of this capitated population. And finally, no strategic planning has occurred between these merged organizations to assess the services needed based on population-unique data in response to the overall strategic

plan of health care provision. Therefore, the projected medical demand of the enrollees, representing a combination of the actual usage patterns, the required services as dictated by TRICARE standards, the population-specific needs and the requirements as dictated by the strategic plan has not been calculated. Subsequently, adequate planning for this enrolled population has not occurred.

In addition, since the enrolled capitated population demand has not been calculated, the provider and support personnel needed to serve this population based on actual need has not been determined. The current philosophy migrates toward using the same provider and support personnel staffing as is currently being utilized with the same productivity goals. But is the current productivity of the providers competitive? For example, Lang and Goforth (1994) estimated that due to taskings, readiness activities, etc., military physicians are available only about 50 percent of a work week to treat patients. Are the same types of providers necessary in this merged organization as were present in the two separate organizations? Can non-physician providers (NPPs) (nurse practitioners and physician assistants) provide the necessary services and, if so, in what proportion? The current productivity of providers needs to be calculated, compared to civilian standards, and evaluated against the anticipated demand to determine the appropriate number and mix of providers and support personnel required to function as a competitive managed care clinic. A strategic philosophy of a team approach in meeting the realm of health care needs of these merged clinics needs to be the underlying approach.

As we evolve into a capitated, managed care system of health care, one that is competing with the civilian sector, we have to "think out of the box" and work together as an integrated team, seeking to fulfill the total demand of this capitated population through the most efficient

mechanism. Otherwise, the threats intrinsic in these multiple changes occurring to Ft. Bragg's health care system will overpower the opportunities, leading to the system's ultimate failure. The JHD clinic is only one of the five enrollment sites which has to address all the supply and demand issues outlined above. Thus, analyzing these issues for the JHD clinic would serve as a template for use by the other enrollment sites as they are developed. Pursuing these issues as a research question affords the opportunity to analyze the complex elements of supply, demand and competition from which the military health care system has previously been fairly immune. It further affords the opportunity to determine how to merge these issues into a final product, a staffing structure, which will impact the entire system of health care at the JHD clinic.

Statement of the Problem or Question

The research question addresses the most competitive staffing structure for the medical component of the Joel Health/Dental Clinic under the TRICARE system of managed care based on supply and demand issues. The research question is: what is the most competitive staffing structure for the medical component of the Joel Health/Dental Clinic under the TRICARE system of managed care?

Literature Review

A managed system of health care is a comprehensive system which addresses the conversion of cost, quality, access, information, management, and accountability into an efficient, effective system (Troy 1996). A corporate approach to health care is critical in a managed care environment with a focus on such issues as strategic, resource, facility and financial planning, monitoring, and evaluation (MacLeod 1995). In serving a capitated

population in a managed care arena, it is crucial to accurately assess the demands and needs of the enrollees and respond with the correct provider mix. This issue of supply and demand management will be addressed in the following.

Demand Issues:

As a system transitions into a capitated environment, the demand per enrollee for outpatient care tends to increase while inpatient utilization decreases (Miller and Luft 1994). This potential outpatient increase reflects the concept of moral hazard, whereby the demand for health care becomes more inelastic to its price, since the client does not have to pay for each encounter (Feldstein 1993). The inpatient decrease is in response to the need to control costs by treating more people on an outpatient basis. For example, Stearns, Wolfe and Kindig (1992) studied 1,444 enrollees with a mean age of 29.5, 49% males, as the system of health care for these individuals transitioned into one of capitation (the level of services remained constant). In this group, inpatient utilization decreased from 87.1 days/1,000 members to 72.9 days/1,000 members. However, the outpatient visits increased from 4.36 physician visits per enrollee to 5.16 physician visits per enrollee, an 18% increase, as the system transitioned into capitation. Broida et al. (1975) conducted a similar study in 1975, revealing a physician visit for enrollees per year rate before capitation of 1.84 and after capitation of 3.69. Cerne's study (1993) revealed 1.74 visits a year per enrollee in an indemnity plan versus 3.03 visits per enrollee in an established HMO. Weiner et al. (1994) studied ten HMOs, revealing a demand of 4.54 visits/year per beneficiary.

McFarland et al. (1985) studied 1,401 adults in a group HMO and found utilization patterns unrelated to marital status, income, occupation and perceived social class. Other variables potentially effecting demand are age, sex, employment-specific needs, amount of co-payment, and plan coverage. Individuals 65 years and older utilize the health services more frequently as compared to younger age groups. For example, Glandon, Counte and Tancredi (1992) report a utilization rate for 62 to 93 year old enrollees of 6.76 visits per year (compared to the lower average utilization rate reflected in the previous paragraph). In addition, children tend to have a higher demand for health care versus the young and middle-aged adult population. Riley et al. (1993) studied the 5-11 year old group, reporting utilization rates of approximately 6.7 visits per year. A study conducted by a family practice physician in an Army community hospital revealed a visit rate of 2.2 visits per year (Miser 1992). However, over 65% of his patient population was between the ages of 17-44 years of age (as compared to a civilian average of 39%). Thus, this lower utilization rate may again reflect utilization variations characteristic of different age groups.

Williams and Torrens (1993) presented the utilization information in Table 1 describing physician contacts in physician offices during 1989 (this is not HMO data but reflects physician contact information).

TABLE 1

Physician Contacts in Doctor's Offices, United States, 1989

	Number per person
Overall	3.2
Age	
Under 5 years	4.1
5-14 years	2.2
15-44 years	2.7
45-64 years	3.6
65-74 years	4.8
75 years +	6.0
Sex	
Male	2.8
Female	3.6

The active duty population has occupation-specific required health care and is confronted with the requirement to seek health care for permission to be absent from work when ill. Subsequently, active duty soldiers' demand is higher than that of individuals in the same age group in the civilian populous, the military active duty demand averaging 5-9 visits per year per beneficiary (Evans 1996). The average visit per active duty soldier at WAMC for FY 94 and 95 was 12 and 10 visits per year, respectively (Resource Management Division 1996). These visits included specialty care. The actual primary care visit rate per active duty soldier was 5 visits per soldier (FY94) and 4 visits per soldier (FY95). However, the multiple difficulties in interpreting military demand needs to be highlighted at this point. For example, these statistics do not include primary care received through unit medical resources (the utilization of which is difficult to assess) and thus do not reflect total primary care demand. In addition, the type of

unit served by a particular primary care site may impact utilization. For example, patient visits per month varied between the primary care sites at Ft. Bragg (which serve specific populations such as those in special operations, airborne units, and support units). The number of visits per year for primary care were: COSCOM (support) soldiers 3.0, the 82nd Airborne Division soldiers 5.0, and the Engineer/Signal/Field Artillery soldiers 4.5 (Mashburn 1995). This is a further example of where the demographic characteristics of the population served, addressing military-unique demographics, need to be evaluated in a demand analysis.

As was previously explained with the concept of moral hazard, the less the co-payment the greater is the tendency to utilize health care services. For example, Jensen (1990) studied the health care utilization of 262 Army retiree beneficiaries in southern Texas ranging in age from 29 to 89 years (with a mean and median age of 61) and found an average of 9.2 contacts per person per year (as compared to 5.7 contacts per person per year for adults aged 25-75 in the civilian population). However, this higher overall utilization rate has not proven to be characteristic in the case of Madigan Army Medical Center's (MAMC) Family Practice Clinic which is currently implementing the TRICARE system. It reported 4.1 visits per year (Evans 1996). The utilization rate at WAMC for FY95 reveals 3 visits per year for active duty family members, 1 for retirees, and 2 for retiree family members (Resource Management Division, 1996). A study conducted at a military family practice residency site revealed approximately 12.86 visits per retiree family, which equated to about 6.45 visits per person per year (Lang and Goforth 1994). However, these retiree visits may not reflect demand, as access for retiree care at some primary care sites in WAMC is limited. Thus, the impact of moral hazard can not be accurately assessed in some groups due to access limitations. Historical data must be interpreted

in light of access to reflect demand. And finally, the covered services a plan offers will impact demand. For example, if the plan includes an aggressive approach to preventive services, then the number of visits per enrollee could subsequently increase.

In summary, the literature reveals a variety of demand data based on variables that are population-specific. In addition, the validity of the reported data addressing military demand may not accurately reflect total demand.

Supply Issues:

Supply issues in a managed care arena target the most efficient and effective methods of providing health care. Provider mix and productivity are critical elements in a cost effective system of managed care. I first turn to a discussion of nonphysician providers (NPPs) and their cost-effectiveness as members of the managed care team.

According to a study conducted by Garfield, Collen and Feldman in 1976, 72.3 percent of patients seen in ambulatory care settings present with problems that a NPP is qualified to treat. A more recent study estimates this figure is 80% (Fitzgerald and Jones 1995). Reflecting the impact of this substitutability, Weiner et al. (1987) calculated that by varying the rate of use of NPPs in the future, the requirement just for pediatricians would decrease by as much as 40%. In addition to being capable of treating the majority of primary care patients, NPP's effectiveness in comparison to the care provided by physicians for preventive care and the treatment of minor injuries for these patients is equal (Hawkins and Thibodeau 1989, Scherer 1990, Mezey and McGivern 1993). Patient satisfaction is often higher for NPPs as compared to physicians (McGrath 1990). This may be related to the increased time (up to 65 percent) NPPs often spend with patients versus the time physicians spend. In addition, NPPs are paid less than physicians.

In economic terms, the substitutability of NPPs for physicians could potentially effect the production function of this process (health care in a managed care setting), shifting the supply curve downward. Thus, the same quantity of service could be provided at a decreased cost. According to Appleby's report (1995), NPPs treating approximately 80% of what the physicians can treat are costing 40% of what the physicians cost. McGrath (1990) devised a formula to evaluate the cost-effectiveness of nurse practitioners (NP) based on substitutability and cost factors. She calculated employing a NP versus a physician could result in a 24 percent reduction in employment costs. However, one major drawback to employing NPPs related to cost savings is in the area of third party reimbursement. Some insurers will not authorize payment of services specifically performed by NPPs. Thus, a practice calculating the cost-effectiveness of NPPs must address the lost third-party reimbursements.

Thus, provider templates must include a balance of physicians and NPPs. Provider ratios per beneficiary will be impacted by such issues as the type of provider panel (closed vs open panel health plans), size of enrolled population, proportion of enrollees in specific age groups, and the geographic location of the practice(s) (Weiner et. al. 1987; Dial et. al. 1995; Kongstvedt 1995). The military's system of care is representative of a closed panel system of care (staff and group HMOs) and thus statistics from those practice approaches are more appropriate in analyzing supply.

Weiner et al.'s study (1987) of seven staff and group HMOs revealed a mean physician to 100,000 enrolled population ratio of 111.2, with 48% (53.6) as primary care physicians. These plans also employed 26.8 NPPs per 100,000, of which 60% (16) were primary care providers. In a similar assessment of three HMOs, the ratio of physician providers to 100,000 beneficiaries

was 77.3, 46% (35.7) of which were primary care providers; the ratio of NPPs per 100,000 was 26.8 (16 primary care). Kongstvedt suggests a physician ratio to 100,000 members of 130 of which 80 are primary care providers.

Dial et. al. (1995) completed a study of 39 group and staff HMOs, revealing the data in Table 2. He determined that HMO size is the strongest correlate of the actual ratios. These statistics parallel the Council on Graduate Medical Education's estimation of the need for 60-80 generalists per 100,000 capitated population (Billi et al.1995).

TABLE 2

FTE Primary Care Physicians per 100,000 Enrollees

	Mean	*Median*
Overall	87.6	68.3
Enrollment Size		
0-79,999	94.9	77.2
≥ 80,000	79.2	59.9
Region		
Northeast	97.4	79.6
South	105.5	77.6
Midwest	77.9	55.7
West	57.4	52.3
Any Medicare Contracts		
Yes (0-79,000)	83.2	78.3
Yes (≥ 80,000)	74.2	67.2
No	99.9	80.2

More than two-thirds (65.4%) of the responding HMOs in Dial et. al.'s study (1995) reported having NPs on staff; almost two-thirds (63.4%) reported having Physician Assistants (PAs) on staff. [This is lower than Kongstvedt's (1995) report of 86% of closed panel plans using NPPs; it agrees with Appleby's report (1995) of 2/3 group and staff HMOs using NPPs.] The median reported use of nurse practitioners per 100,000 members was 19.7 of which 70% (13.8) were primary care. Physician assistant employment median was 8.1 (5.7 primary care) per 100,000 beneficiaries. Dial et. al. additionally explored the impact of NPPs on the ratios of beneficiaries per physician. Those HMOs with no NPPs averaged 77.7 primary care physicians per 100,000 beneficiaries; those with NPPs averaged 47.6 primary care providers per 100,000 beneficiaries.

Another mechanism for determining provider supply needs is to evaluate provider productivity against demand and subsequently determine the required manpower to meet this demand. Unfortunately, the literature presents conflicting results and opinions in relation to productivity upon which to base supply determinations. According to Hurdle and Pope (1989b), physicians on salary and in large group settings have a decreased productivity as compared to their solo counterparts. Dial et. al. (1995) also reported similar findings. Their analyses indicated the incentives for increased productivity were not present, since staff or group members were paid on a salary basis versus a capitated basis. However, Anderson and Gans (1993) found contradictory results. They compared capitated vs non-capitated HMOs, reflecting a difference in encounters per full-time equalivent (FTE) physician of 559 in 1988 with capitated encounters being higher (942 average encounters in non-capitated HMOs compared to 1,501 in capitated HMOs). In 1993, this difference had decreased but the capitated productivity

remained higher with 1,077 encounters per physician in the capitated groups versus 1,058 encounters per physician in the non-capitated groups. The authors did not elaborate on these findings which saw a decrease in the capitated physician's productivity yet at a rate above that of non-capitated physicians. The use of non-salary incentives in managing cost (increasing productivity) may be a potential answer for the larger capitated rate

In analyzing productivity, visits are easily measured but imperfectly represent physician output because they do not capture the intensity component (Hurdle and Pope 1989a). Revenue and cost data per provider is a more accurate reflection of productivity (Pope 1990). An additional flaw in evaluating productivity data is in the definition of full time equalivent. The hours worked per week and weeks worked per year will impact productivity data of total patients seen. Therefore, to adjust for FTE measurement variations, productivity data on a per hourly production is more appropriate. In addition, productivity statistics often do not reflect the support personnel available to the practitioner. For example, Reuben et al.'s study (1993) which evaluated NPPs as support personnel to physicians (a variable which will impact productivity) found they could increase the productivity of physicians by 15-36%. Thus, an analysis of productivity must address support personnel. Additional simultaneous responsibilities of providers must also be considered when addressing productivity. Mendenhall et al.'s 1980 study of physicians (n=317) who supervised NPPs reported a direct patient encounter per day rate of 18.9; those not supervising NPPs (n=398) were reported to have a rate of evaluating 21.4 patients per day.

Due to the complexity of the factors in productivity reporting, an in-depth review of the literature did not reveal significant productivity findings.. Mendenhall et.al.'s productivity

analysis reported above was the most thoroughly documented analysis, although it is based on data over 15 years old. Miser's study (1992) revealed a productivity of 22 patients per day. Kutch (1995) projects a productivity of 19.93 visits per physician per day. Government contracts utilize 3.5 visits per hour for family members and 2.5 visits per hour for retirees. Results from inquiries of a local practice reveals a productivity for physicians of 4 patients per hour (Cardinal 1996).

The American Academy of Physician Assistants (ND) report PAs see an average of 22 outpatients per day. This conflicts with Mendenhall et al.'s study in 1976 which found PAs see 14.2 patients per day (1980). (This difference may reflect the increased focus in recent years on managing costs by increasing productivity.) Mendenhall et al.'s study indicates NPs saw 7.9 patients per day, or approximately 50% of those seen by PAs. The increase in productivity of PAs versus NPs has been shown to be consistent in other studies (Jones and Cawley, 1994). This longer patient encounter time was attributed to the increase in teaching and counseling (thus extending encounter time) which was characteristic in the practice of NPs more than PAs. As previously indicated, the availability of support personnel to the provider effects productivity. It is therefore important, in analyzing productivity, to review the appropriate amount of ancillary support personnel characteristic in managed care organizations. Anderson and Gan's study (1993) of 105 practices revealed an average FTE physician to support staff ratio in 1992 for capitated practices of 1:5.23; for noncapitated practices of 1:4.73. This has increased over the past year, as reflected in Table 3.

TABLE 3

Support Staff per Physician in Capitated and Noncapitated Practices, 1993

	Administrative support	Medical support	Total
Capitated	1.41	2.82	4.23
Noncapitated	1.28	2.68	3.96

A local Fayetteville, N.C. practice (15% capitated, 85% noncapitated) employs 2.3 administrative and 1.4 nursing personnel per health care provider for a total of 3.7 support personnel per provider. A Hope Mills, N.C. practice employs 2.3 administrative and 1.7 nursing personnel for a total of 4.0 support staff per provider (Cardinal 1996).

In summary, a multiplicity of factors must be addressed in determining a competitive staffing structure for a managed care system. Demand issues that are population and plan specific must be evaluated in the light of provider supply issues to determine the most efficient and effective mix of providers and support personnel. Current military standards for calculating supply and demand have to be updated to reflect actual volume and based on a competitive structure in relation to civilian managed health care organizations. Having a fixed number of enrollees per provider may not accurately address the demand characteristic with the specific population group. Only through an analysis of these variables can the JHD clinic plan to meet its beneficiaries' demands and subsequently increase its potential to succeed.

Purpose of Study

During these current times of budget cuts and increasing health care costs, the need for the military to function as a competitive health care entity can not be over-stated. As the health

care system at Ft. Bragg evolves into a managed care environment, it must aggressively address efficiency and effectiveness issues. This review of the literature indicates a variety of variables impact the determination of the most competitive staffing pattern for a capitated practice. Thus, the purpose of this study is to describe the supply and demand factors impacting the staffing for medical care at the JHD clinic as it serves the anticipated capitated population and determine the most competitive staffing pattern. The research question, as indicated previously, is: what is the most competitive staffing structure for the medical component of the Joel Health/Dental Clinic under the TRICARE system of managed care? This descriptive study will address the current demand of the beneficiaries who will be enrolled in the JHD clinic, the anticipated demand, current military site-specific productivity statistics, civilian productivity statistics, ancillary support, and the financial impact of not achieving a competitive stance. The variable *competitive* is defined as a productivity staffing model paralleling that of civilian practices in the local area. To illustrate the competitive element of this issue, this study will include an analysis projecting the cost of decreased productivity (ie calculating the financial cost if a provider does not meet the competitive productivity level). This will subsequently provide health care planners with a mechanism for evaluating a staffing balance between military providers (who are often required to participate in military-specific demands and thus may not be available during clinic times to evaluate patients) and civilian providers.

In answering this question, a number of subquestions need to be addressed:

Subquestions - Demand

Current demand is defined as the current utilization patterns. It is beyond the scope of this investigation to perform a member analysis addressing their demand, of which utilization is

only a partial reflection (Durham 1994). (Demand includes individual preferences as well as age and sex needs.) The translation of these needs and wants into actual utilization as reflected in member visits per year combined with the demand generated by TRICARE standards will serve as the demand data.

1. What is the current demand (utilization) of the anticipated enrolled beneficiaries?

2. What is the anticipated demand (need) of the enrolled beneficiaries based on the clinic's strategic plan (defining the level of services to be provided, i.e. primary care, specialty care) and requirements of the TRICARE system?

Subquestions - Supply

1. What is the current productivity of the health care providers (physicians, nurse practitioners and physician assistants) in TMCs 21 and 22? Productivity will be defined as patients seen per hour and patients seen per month (to reflect availability in the clinic).

2. What is the productivity of civilian managed care organizations?

3. What is the most competitive staffing structure for provider and ancillary support personnel? This subquestion involves combining demand data with productivity data to determine the staffing needed. The differences in staffing needs based on productivity variances between the current staffing and civilian practices will be interpreted in light of additional personnel needed (physicians, NPPs and support personnel). This will be translated as a cost in salary increase/decrease or beneficiary gain/loss.

CHAPTER 2

METHODS AND PROCEDURES

The issue is to determine the needs of a capitated population (those enrolled at the JHD clinic) based on historical and projected demand and to determine the most competitive staffing model for fulfilling this demand through analyzing provider productivity issues. This will afford the opportunity to determine the competitive staffing structure necessary for the JHD clinic as it transitions into a managed care system.

This research is a quantitative descriptive study. The methods and procedures will parallel, in sequence, the supply and demand subquestions.

The demand of the anticipated enrolled beneficiaries will be calculated by first determining the units to be served. Utilization of the population from the period Apr 95 - Mar 96 from these units will be obtained from TMCs 21, 22, the outpatient clinic, and the emergency department from the Composite Health Care System (CHCS) data. (This time frame represents a period directly after the establishment of CHCS at these sites.) These current demands will be balanced by the expected increase or decrease in the FY98 troop population projection of the units served by the JHD clinic.

Next, the amount and type of services to be provided based on TRICARE age and sex specific standards will be calculated for the anticipated population. The JHD clinic's strategic plan addressing services to be provided will potentially add to the demand analysis (primary care

accurate, and; is there consistency between input operators in their interpretation of visits? Subsequently, if patients are not entered into the CHCS system or provider hours are incorrectly documented, the resulting statistics will not be accurate. However, these reporting systems are the primary documentation systems used by the Army for determining demand and productivity and subsequently will be utilized for this study. Their limitations will be considered.

This data will next be interpreted in light of civilian productivity data to determine competitiveness. An in-depth descriptive analysis of reported current civilian productivity statistics will be conducted. The review of the literature presented statistics which are not current and thus need to be updated. Data from local and national organizations and practices will be obtained. This data will include not only provider productivity by type (physician, NP, PA) but also the amount of support personnel required for these productivity standards.

The amount of time required to evaluate and treat a patient will vary based on the diagnosis treated. For example, a new obstetrics visit is scheduled for 30 minutes, same day appointments with a NP for 15 minutes, a well woman visit for 20 minutes. Thus, a provider who evaluates only same day outpatient patients will have an increased productivity. An assumption of this study is that over time each type of primary care provider (physicians, NPs, PAs) will be treating a balance of patients and subsequently productivity data within each type is comparable.

Based on the current productivity of the providers at TMCs 21 and 22 with the current ancillary support structure, the anticipated demand will be compared to the current visits conducted to determine shortfalls. For example, if the physicians, NPs and PAs collectively conduct 2,000 patient appointments a month and the anticipated demand is 3,000 visits a month,

a shortfall of 1,000 visits will occur. Next, the productivity of civilian providers will be compared to the demand to determine shortfalls. If, based on the productivity of civilian agencies with the same staffing, these 3,000 visits can be conducted, the difference can be translated into members not served and the need for these beneficiaries to be enrolled elsewhere. This can be translated into a financial loss of enrollees. Next, based on productivity of civilian providers with their associated support personnel, an effective provider mix, and the anticipated demand, a staffing structure will be calculated. This will reflect the needed alterations to the current staff needed to serve the capitated population. The cost of this will be compared to the cost of beneficiary gain/loss.

Military-specific demands of health care providers (i.e. training and readiness demands) decrease their availability to treat patients. Thus, the "ideal" staffing structure based on this civilian structure can serve as a starting point for calculating an appropriate balance between military and civilian providers. This information will be presented in a spread-sheet format to determine the financial impact of altering the military/civilian balance.

Throughout this process, no reference to any specific patient or provider will occur. In calculating provider productivity the data will be extracted by provider name and the subsequent calculation completed but the data will be reported by type of provider (NP, PA, physician). The current staffing structure of TMCs 21 and 22 combined contain at least one provider per category and thus no individual inferences can occur.

Thus, through the process detailed above, a thorough demand and supply analysis for the JHD clinic's medical services under TRICARE will be conducted. Civilian standards will be utilized to assess competitiveness. These standards and current provider productivity will serve

as the basis for determining the most competitive staffing structure for the JHD clinic as it evolves into a managed care system of providing health care.

CHAPTER 3

RESULTS

Introduction

The following section presents an overview of the services to be provided at the JHD clinic as a primary care enrollment site within the context of its strategic plan. This information is followed by the research related to the demand and supply subquestions.

This investigation defined productivity as the number of patients per time period a provider could treat and combined this production figure with the capitated population's demand to determine the number of providers required. However, within the managed care capitated arena, patients are enrolled to a clinic and subsequently incorporated to a provider's panel. This provider is responsible for the patient's primary care needs. Thus, the size of the provider's panel, or the number of patients he can adequately care for, reflects both the demand of the patients and the supply (productivity) of the provider. Subsequently, in researching the demand and supply subquestions, panel size was addressed next.

Following the discussion on panel size, research on the mix of providers is presented. This section will conclude with the staffing structure results of combining the data on supply, demand, panel size and provider mix.

A final element to the original study was to examine varying staffing structures in relation to cost of salary increase/decrease or beneficiary gain/loss. In a capitated system such as

TRICARE, payment to the provider is per enrollee. Thus, an analysis of the financial impact of varying staffing structures must be made based on the impact these structures would have on the payments received for the enrolled beneficiaries. However, the formula for calculating the amount to be allocated per beneficiary enrolled in TRICARE is currently being revised and will not be available until approximately June, 1997 (Kearns 1997). Since WAMC has not been funded under a managed care capitated structure in the past, historical data was not available. In addition, the amount paid per beneficiary is for all services, primary care and specialty care. The percentage of the capitated amount specific for primary care services and thus a realistic figure to utilize in financially analyzing staffing structures could not be calculated. Thus, the data to support this part of subquestion number three of the supply section was not available.

An assumption throughout this analysis of demand, supply, and the resulting staffing structures is that quality will not be compromised.

Strategic Plan for Joel Health and Dental Clinic

The JHD clinic is currently under construction and is projected to open in the summer of 1998. It will merge TMC 21 (the COSCOM Medical Clinic) and TMC 22 (the Aviation Clinic). It will serve as the primary care enrollment site into the TRICARE program for active duty and family members from the 1st Corps Support Command, the 44th Medical Brigade and the aviation units assigned to Simmons Army Airfield as well as to a specific number of the retiree population.

The clinic will provide comprehensive primary care under the TRICARE program of military managed health care, including acute, chronic, and preventive care for its enrolled

population. Services such as military sick call, acute minor illness care, well child care, routine OB-GYN care, routine adult wellness care, physical examinations, immunizations, and limited procedures will be conducted. Patients needing specialty care will be referred to Womack Army Medical Center.

Analysis of Demand

Introduction

Identifying the population to be enrolled at the JHD clinic and the anticipated demand of that population for primary care services from their historical use was the proposed approach for this study. This data, combined with the health promotion and wellness needs of the enrollees, would reflect the projected demand of the capitated population to be served at the JHD clinic. Unfortunately, determining the current demand for this identified group was not possible due to the inaccurate and inefficient systems for data capture characteristic during the targeted period. Obtaining data on the anticipated enrollees would have required an individual analysis for each enrollee at all the sites providing care (TMCs, Outpatient Clinic, Emergency Department, civilian system), some of which did not document retrievable demand statistics. This would have necessitated the Information Management Division writing a specialized computer program for extracting the data which would not have captured all required elements. Due to the time-intensive nature of this endeavor and the invalid result, the researcher elected to analyze and utilize statistics from similar sites.

Data on 90% or greater capitated primary care practices (family practice, internal medicine and pediatrics) in the North Carolina geographical region or military sites comparable

to the JHD clinic was not available due to agencies not collecting the indicated data or, because of proprietary (confidentiality) issues, their refusal to release the data. Thus, the study results presented in the following statistics were gathered from a variety of current resources to reflect information on any of these variables (primary care, over 90% capitated, in the indicated geographical region and/or from military) and not solely managed care practices meeting all the population and site-specific criteria characteristic of the JHD clinic. The statistics presented will be yearly and monthly for comparability and consistency with the format of the statistics presented in the research. Those statistics used in calculating the staffing template for the JHD clinic are incorporated into a spreadsheet (for example, Appendix 2, Chart 16). Thus, the reader can alter the assumptions and input data, if desired, to calculate a different staffing ratio as well as to evaluate the impact of changes in enrollee demand or provider productivity.

The following analysis will first identify the population to be served by the JHD clinic. Their anticipated demand will be analyzed based on demand reflected in other military treatment facilities. Due to the lack of demand data for family members and retirees, state and national statistics will be explored.

Population of Joel Health and Dental Clinic

To determine the demand for services, the population group needed to be identified first. The Resource Management Division (RMD) of WAMC provided information on the total population to be served at Ft. Bragg:

Retrospective Analysis Population System (RAPS) Fiscal Year (FY) 97 population data for WAMC projects a population of

48,291 active duty
63,940 active duty family members, (1.324 family members per soldier) and
41,087 retirees/retiree family members
153,318 total population at Ft. Bragg, FY 97

This data is not expected to change significantly for FY98 and thus will be used in this analysis.

A strategic planning goal of an enrollment of 120,000 beneficiaries is targeted for WAMC's system (Auer 1997). Therefore, the total enrolled population is projected to be:

48,291 active duty
47,953 family members (48,291 * 1.324 * .75) Note: this assumes a 75% enrollment of family members
23,756 retirees/retiree family members (to account for the remaining population to equal 120,000)
120,000 total enrolled population

According to statistics and the experience of individuals working at TMC 21, the ratio of family members to an active duty individual was calculated to be approximately 1.75 (JHD Clinic Transition Office 1997). Therefore, of the Ft. Bragg population, the JHD clinic is to enroll (based on UIC codes and active duty population as identified in the Army Stationary Plan):

8,100 active duty
10,631 family members (8,100*1.75*.75)
7,500 retirees/retiree family members (Griffiths 1997)
26,231 total enrolled population

Anticipated Demand

Military Treatment Facility Demand

Demand statistics vary according to variables such as plan access, covered services, and population-specific issues such as demographics. Thus, national statistics may not accurately reflect an estimated demand for the enrolled military population under TRICARE. Statistics on utilization from other military sites implementing TRICARE, and thus implementing the same standards as those which will be required for TRICARE at Ft. Bragg, would more accurately depict the potential enrolled beneficiary demand. Unfortunately, contact with two lead agents in TRICARE regions have not resulted in the required utilization frequencies for TRICARE Prime enrollees (the managed care option) at other TRICARE sites. This type of data has apparently not been kept. Hundreds of pages of utilization statistics from the Patient Administration Systems and Biostatistics Activities and pages of enrollment numbers from a lead agent could not be matched to reflect utilization of TRICARE Prime patients.

Evaluation of specific sites implementing TRICARE provided limited data. In an article by COL Paul Evans, a practicing physician at Madigan Army Medical Center at Ft. Lewis, Washington, a site implementing TRICARE, he reported 4.3 visits per member per year (PMPY)[2] at Madigan's family practice clinic and 4.6 visits PMPY in the Adult Primary Care Clinic (Evans 1996). Baylor Healthcare Administration Residents at Ft. Sill and Ft. Polk, TRICARE sites, have provided some data but caution against strict interpretation of these statistics due to inadequacies in capturing data. At Ft. Sill, the yearly visits of active duty members for FY96 was 5.04 visits/year; for active duty family members it was 3.58 visits per

[2]Unless otherwise notes, visits are for primary care services

year. At Ft. Polk the overall visits (with no differentiation between categories of patients) was 9.89 visits per member per year. The demand for primary care services in 1992 (prior to TRICARE) in the national capital region was 6.5 visits per Army soldier per year; 1.5 visits per year for Navy active duty personnel and 8.3 visits per year for Air Force active duty personnel (Cornell 1997). The primary care demand statistics per year for active duty soldiers in WAMC's system for FY92 - FY96, also prior to TRICARE, were: FY92 - 5; FY93 - 4; FY94 - 5; FY95 - 4 and FY96 - 5 visits per year (Resource Management Division 1996).

The average of the statistics above for active duty personnel is 4.8 visits per year. However, the medical director for the JHD clinic indicated his experiences reflect a demand of about 4.3 for the active duty population (Unser 1997). Thus, considering the statistics presented previously and the potential increased demand under TRICARE secondary to the health promotion and wellness requirements, a figure of 4.5 visits per year was agreed upon as the active duty demand for this study. The demand statistics for family members and retirees is augmented in the following section with state and national statistics.

General Family Member Demand, State

The North Carolina Department of Insurance licenses HMOs in North Carolina (1996). Their statistics of thirteen licensed HMOs reveal a range of physician encounters per member per year from 2.8 - 5.0 with a weighted average of 4.07 encounters PMPY (1995) (Appendix 2, Table 4).

General Family Member Demand, National

Medical Group Management Association (MGMA) Survey Operations Department: This department published a report representing an extensive research of 12 months of data from 1,065 of its member practices across the United States. The *Cost Survey: 1996 Report Based on 1995 Data* includes 37 single specialties in North Carolina (of the 711 single specialties responding) and 10 multispecialty practices in North Carolina (of the 354 responding multispecialty groups). Results from this analysis revealed the number of nonsurgical encounters (any visit for primary care activities) per patient for better performing practices with capitation during the 12 month period was 4.03; for multispecialty practices in the eastern region as 2.96, for practices with 11-50% capitation as 2.96, and for multispecialty practices with 11-25 full-time equivalent (FTE) physicians as 2.58. [3]

The *HMO-PPO Digest*: (Hoechst Marion Roussel, Inc 1995) documents 3.6 physician encounters (excluding well baby and psychiatric visits) per non-Medicare member per year in North Carolina HMOs. Nation-wide their statistics are the same as in North Carolina, reflecting 3.6 encounters per year for non-Medicare individuals.

Medical Group Practice Digest: from Hoechst Marion Roussel, Inc. (1995) presented statistics from the Unified Medical Group Association (composed of medical group practices with varying degrees of capitation). The statistics from 40 medical group practices in 6 states covering 1,812,828 lives reveal a PMPY demand of 3.78 ambulatory care visits.

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General Demand, Summary

Table 5 (Appendix 2) is a summary of the demand statistics by source (as presented in the references above and in the literature review). It reflects a wide variation in use overall for enrollees in capitated programs ranging from 2.96 to 9.89 visits PMPY with an average at civilian institutions of 3.89. Madigan Army Medical Center has been implementing TRICARE for over two years and reports a demand of 4.3 to 4.6 visits PMPY. The researcher, in consultation with JHD clinic's medical director, will utilize a PMPY usage of 4.0 for active duty family members reflecting a demand close to the experiences of Madigan yet simultaneously close to the civilian average.

Retiree Demand

A study conducted at a military family practice residency site determined that 12.86 visits per retiree family was the average demand, which equated to about 6.45 visits per person per year (Lang and Goforth 1994). However, these retiree visits may not accurately reflect demand, as access for retiree care at some primary care sites in WAMC was limited. Madigan Army Medical Center's calculation of demand for individuals over 65 considered each over- 65 individual equaled 3 regular patients, or three times the appointments of individuals in younger age groups (Evans 1996). The Medicare average for surveyed HMOs reflect a 7.9 per year primary care utilization rate (Hoechst Marion Roussel, HMO-PPO Digest 1995). Glandon, Counte and Tancredi's study (1992) indicated individuals 65-74 years of age used primary care services approximately 6.76 times per year. These two over 65 demand figures averaged to a demand of 7.3 visits per year. (Even though these statistics are for individuals over 65 years of

age, they will be used in this study due to the lack of retiree-comparable age group data.) Due to a potentially limited access issue with a demand of 6.45 and the need for comprehensive care under TRICARE, a demand figure of 7.3 visits PMPY will be used in the analysis.

Total Demand Statistics, Summary

The unavailability of demand data by sex and/or specific age group and the uncertainty of JHD clinic's population in relation to these factors necessitated the researcher use the numbers documented below representing broader categories of patients.

For the purpose of this study, the following demand figures will be utilized:

Active duty: 4.5 visits PMPY
Family members of active duty: 4.0 visits PMPY
Retirees and their family members: 7.3 visits PMPY

Therefore, the demand of the anticipated 26,231 enrollees to the JHD clinic is calculated to be:

Active duty: 4.5 visits PMPY x 8,100 anticipated enrollees = 36,450 visits per year
Active duty family members: 4.0 visits PMPY x 10,631 anticipated enrollees = 42,525 visits per year
Retirees and their family members: 7.3 visits PMPY x 7,500 anticipated enrollees = 54,750 visits per year

For a total visits per year demand from the capitated population of 133,725

The study's original proposal was to analyze the amount and type of preventive services to be provided based on TRICARE age and sex specific standards, adding this additional demand calculation to the current demand of JHD clinic's population group to reflect the anticipated capitated demand. Due to the lack of local military demand statistics, this approach was not possible. The majority of the demand figures indicated above reflect demand of

individuals in capitated arrangements similar to HMOs. In these managed care environments, it is assumed that similar preventive services are practiced. Subsequently, these demand statistics reflect all patient demand, that of care for acute and chronic care as well as preventive services. Thus, these figures will be used in the study as the demand values.

Analysis of Supply

Introduction

The needed supply of practitioner services for the JHD clinic will be based on the productivity of the providers, the best mix of providers, and the demand of the beneficiaries. However, this analysis must address issues of support personnel, since productivity is directly influenced by the number of support personnel available to the practitioner. For example, Reinhardt (1975) in his study of physician productivity concluded that if the number of aides were doubled (from two per physician to four) the weekly physician productivity statistics would increase 25-55%, depending on specialty. Thus, the results below present the productivity of the providers and the corresponding support personnel for these productivity figures, if available.

Recent studies have indicted the number of patient visits or hours worked may or may not be accurate proxies for productivity (Hart et al. 1997). Managed care organizations strive to reduce patient visits by substituting other services or by emphasizing health promotion activities. Thus, "productivity" reflected as number of patient visits would decrease in these demand management strategies yet determining the physician is less productive would subsequently be inappropriate. In further highlighting this point, Hurdle and Pope (1989b) discussed that women physicians tended to see fewer patients per hour as compared to men yet there was no significant

productivity difference between the sexes when gross revenues were used to measure output. Thus, once again, using the visits per hour as a measure of productivity for the managed care program would be inappropriate.

However, recognizing these limitations, visits will be used as a measure of productivity in this study. This will enable the calculations for panel size and beneficiary enrollment. The current productivity of TMC 21 and 22's providers will be calculated first. Next, the U.S. Army Medical Command's (MEDCOM) productivity standards will be applied to the JHD clinic to reflect an anticipated required productivity for the military system. And finally, the civilian system will be discussed, addressing local, state and national productivity statistics. Throughout this discussion, where possible, support personnel intrinsic to these productivity statistics will be presented.

Current Productivity of Providers/ Available Support Personnel in TMC 21 and TMC 22

Productivity Calculated from Clinic Data

Provider: The study's supply analysis first evaluated provider productivity at TMCs 21 and 22 for the periods Oct 95 - Mar 96. [Due to the intensity of effort from a variety of individuals in obtaining a by-provider breakdown of patients seen (over 100 pages of data for the 6 month time period) and hours worked, data was obtained for a six month versus the originally proposed twelve month period.] Data from CHCS indicated 23 providers treated patients at TMCs 21 and 22 for this time period. However, data from MEPRS did not match the CHCS data. Of the 23 providers from CHCS, only 9 of them were accounted for in the MEPRS system.

Thus, 14 providers were not accurately recorded in the manpower system and thus productivity statistics could not be calculated for these providers.

The SPSS statistical program was used to calculate the median productivity of the physicians (by clinic) and the NPs. This analysis reveals physicians from TMC 21 saw a median number of 1.90 patients/hour; physicians from TMC 22 a median of 1.91 patients/hour; and the NPs a median of 1.90 patients per hour. Due to the unavailability of actual productivity statistics for PAs, productivity guidelines reflected in the literature were used to calculate the productivity of PAs at these TMCs. The American Academy of Physician Assistants presents the productivity of PAs (as reflected in a study of PAs working in the Kaiser Permanente's northwest region of HMOs) to be 0.35 more patients per hour than NPs (American Academy of Physician Assistants, ND; Hooker 1993). Thus, using the current productivity of 1.90 patients/hour for NPs, a calculation for PA productivity is 2.25 patients/hour.

Support Personnel: The Functional Manning Roster (FY96 Functional Manning Roster 1996) indicated FTE support personnel assigned to TMC 21 included 3 nurses, 11 other clinical support and 11 administrative personnel for a total of 25 support personnel. These individuals supported the 5.87 (average) monthly FTE providers treating patients (as documented in MEPRS) for a ratio of 4.3 support personnel to each provider. However, this ratio is skewed due to the fact that according to CHCS, an average total of 10.8 providers per month treated patients at TMC 21, a large majority of which were not accounted for in the MEPRS system. The FTE input at TMC 21 of these providers was subsequently not available and thus the support to provider ratio based on actual FTEs could not be calculated. Using strictly a figure of 10.8 providers-treating-patients to 25 FTE support personnel would yield a 2.3 FTE support to

providers-treating-patients ratio. The 1 nurse, 3 other clinical support and 6 administrative FTE personnel assigned to TMC 22 supporting the 2.9 FTE providers would yield a 3.5 support to provider ratio. However, CHCS indicated an average of 9.8 providers per month treated patients at TMC 22 yielding a 0.98 FTE support to providers-treating-patients ratio.

Productivity Calculated with Statistics from Manpower Assessment Team:

A Manpower Assessment Team from the Academy of Health Sciences conducted a site visit to WAMC in September 1994 and determined the hours providers invested in specific activities including clinic care (Delaney 1996). The available provider hours for clinic care per month as analyzed by this team for TMC 21 was 109.04 hours and TMC 22 was 128.17 hours. Thus, based on the current productivity as reflected in the calculations above (using 1.90 patients per hour for physicians) and the available hours for patient care as determined by the assessment team (using 118.6 hours as the average of these two TMCs), the number of patient visits that could be accommodated by type of provider per month is 225.3 for physicians, 225.3 for NPs, and 272.8 for PAs. The Table of Distribution and Allowances (TDA) for the JHD clinic when it opens authorizes four physicians, two nurse practitioners, and four physician assistants to provide primary care. Based on the productivity statistics above, these practitioners would conduct a total of 2,443 visits a month or 29,318 visits a year. The demand for the anticipated enrolled population is 11,144 visits monthly or 133,725 visits a year. Therefore, 104,407 annual visits could not be accommodated. This translates into not being able to enroll any retirees, no family members and only 6,515 of the 8,100 active duty. Thus, 19,716 individuals of the targeted 26,231 enrollees could not be enrolled with the current documented productivity rate.

Productivity Calculated by RMD:

The RMD at WAMC has begun a quarterly productivity analysis in attempting to increase productivity accountability in each of the clinical areas (Analysis Branch 1996). Statistics for the first report month (Sept 96) included complete data from MEPRS on only 3 physicians, 1 NP and 1 PA from both TMC 21 and 22. This extremely limited sample revealed productivity of 1.5 patients per hour for physicians (average), 1.4 for the PA and 2.42 for the NP. Due to the inappropriately low sample size, these statistics will not be used in this study.

MEDCOM Productivity/ Support Personnel Standards

The Manpower Requirements Branch at MEDCOM is developing a second generation manpower staffing model (discussed further in section "Calculation of Staffing for JHD Clinic") for use in military treatment facilities to calculate personnel requirements (1996). This model uses a productivity figure in its formula for calculating requirements based on civilian productivity statistics (Saffells and Chavez 1996). This figure, called a medical planning factor (MPF) represents an amount of time allocated for each patient by specialty area and includes actual care as well as administrative time. It has a corresponding support staffing ratio. The MPF for primary care is 0.244 hours per patient (4.1 patients per hour) with a provider to support personnel ratio of 1:1.9. Thus, according to this model, a practitioner should spend 14.6 minutes with a patient, including all administrative time. This equals evaluating 32.8 patients in an eight hour day (8 hours /0.244 hours per patient). The MPF for the flight medicine clinic is 0.425 hours (25.5 minutes per patient or 2.35 patients per hour) with a provider to support staff ratio of 1:1.750. In an 8 hour day, 18.8 appointments should be accomplished.

Civilian Productivity/Support Personnel Statistics

Local and State Productivity

Practice statistics from a family medical practice in Fayetteville indicate their providers, PAs as well as MDs, evaluate 25-30 patients a day, or 3.1-3.75 patients per hour in an 8 hour day. The 6.5 providers accomplish this with 25 administrative and clinical support personnel, for a ratio of 3.85 support personnel to provider (Costanzo 1996).

A consultant with Healthcare Consulting, Inc (a consulting firm in North Carolina) states that his experiences indicate provider productivity is: physicians, 6 patients per hour; physician assistants, 3-4 patients per hour; and nurse practitioners, 2-4 patients per hour (Cox 1996). These productivity statistics are accomplished with 4-6 FTE support personnel per provider.

National Productivity

Overview: Current national practice statistics were obtained from articles analyzing productivity at group-model HMOs; from the Center for Health Policy Research of the American Medical Association; from MGMA's *Cost Survey: 1996 Report Based on 1995 Data* (referenced previously); and a publication from the Center for Research in Ambulatory Health Care Administration (CRAHCA of MGMA) called the *Performance Efficiency Evaluation Report (PEER) List of Medians, Annual 1995.* The mechanisms for reporting productivity varied between these reports, some reporting in patients per hour, others in encounters per year (without a hour availability per year for calculating a hourly productivity figure). Reported support personnel in some analyses included only administrative personnel whereas others included clinical and administrative personnel.

National - Overall: Productivity statistics from the Kaiser Permanente Northwest Region as of 31 Dec 92 reflect a productivity in internal medicine of 2.39 patients per hour for physicians, 2.61 patients per hour for PAs and 2.26 patients per hour for NPs (Hooker 1993). In family practice clinics, the productivity rates for physicians and PAs were 3.10 patients per hour and 2.97 patients per hour respectively (no NP productivity for family practice was documented). Hurdle and Pope's analysis revealed an average of 3 patients per hour for physicians in general practice/family practice (1989). Hooker and Freeborn's report indicated a 24 patient per day rate for physicians and PAs (1991) or approximately 3 patients per hour in an 8 hour day.

National - Center for Health Policy Research (American Medical Association): Additional statistics were obtained from the Center for Health Policy Research (a primary source for data used in calculating the MPF military model according to Mr. Saffells, senior analyst at MEDCOM) as documented in their *Physician Marketplace Statistics, 1994* publication. These statistics (Table 6, Appendix 2) indicate family practice physicians in general treat 2.9 patients per hour with 2.0 non-clinical support personnel per physician (no clinical support personnel were included). Slightly decreased productivity is characteristic in practices with over eight physicians (2.7 patients per hour) yet with only 0.8 nonclinical support personnel. Practices in the South Atlantic averaged 2.3 patients per hour with 2.0 nonclinical support personnel per physician.

National - The *Cost Survey: 1996 Report Based on 1995 Data* (MGMA 1996): The *Cost Survey* reported the number of nonsurgical encounters per year per provider (Table 7, Appendix 2). Unfortunately, there was no indication of hours worked per year to calculate an hourly

productivity figure. However, according to the Center for Health Policy Research's survey results of 493 practices (1994), the average total time family physicians are available for patient care in the clinic is 140 hours per month (working a 48 week year). Using this availability figure combined with the MGMA data, the family practice provider productivity is approximately 2.5 visits per hour.

Support personnel per provider characteristic in these surveyed practices are summarized in Table 8 (Appendix 2). Family practice physicians in 78 practices reported a median support staff, including administrative and clinical support, of 4.45 staff per physician. As the percentage of capitation increased in practices, so, too, did the support staff. In practices with 11-50% capitation, the support staff per physician was 4.7; in practices with 51-100% capitation, the support staff per physician increased to 5.85 (These higher figures as compared to the *Physician Marketplace Statistics* reflect administrative and clinical support personnel combined whereas the *Physician Marketplace Statistics* represent administrative personnel only.)

National - *PEER* report (1996): This report presents the type of support staff per physician (Table 9, Appendix 2). Twenty-seven family practice groups documented 3.09 support personnel per physician (the exact breakdown of these 3.09 individuals as to the type of support they provide for each one of these twenty-seven practices is not available). Eleven practices in the survey reported 0.35 administrative staff per physician and twenty-seven practices indicated 2.52 medical support staff per physician.[4]

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Summary - Civilian Productivity and Support Personnel

The literature reviewed thus far presents productivity rates without any indication of outcomes from the various rates. Camasso and Camasso (1994) studied physician productivity and how it affects the technical care performance of preventive and well care in six major patient management areas. They found the encounter level of three patients per hour appears to function as a critical demarcation point. Beyond this level, there is a decrease in the performance of technical primary care. They also found that higher productivity levels resulted in a greater incidence of outside consultation referrals, a cost-to-benefit reversal of the higher productivity rate.

The variability of the productivity statistics cause complications in establishing a benchmark guideline. The average of the primary care physician productivity statistics from the Center for Health Policy Research (2.9 patients per hour), production calculations from the *Cost Survey* (2.5 patients per hour)[5], Hooker and Freeborn's report (3 patient per hour), the Kaiser study (3.1 patients per hour), and the study results of Hurdle and Pope (3.0 patients per hour) is a productivity of 2.9 patients per hour (Table 10, Appendix 2). Thus, a figure of 2.9 patients per hour for physicians will be utilized, reflecting the average and a figure within the demarcation point from Camasso and Camasso's study. Since studies vary as to the productivity of NPPs being higher or lower than physicians, the figure of 2.9 patients per hour will be used for this provider group, also.

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The support personnel, administrative and clinical, averages to 3.77 individuals per physician provider (average of the MGMA *Cost Survey* and the MGMA *PEER report)* (Table 10, Appendix 2*)*.[6] However, the military clinics are supported with hospital staff for some administrative and clinical functions. Support staff such as those individuals working in the primary care practice's business office, housekeeping, information services, lab, and radiology sections, which constitute 32% of the support staff in a family practice setting according to the *Cost Survey* (MGMA 1996)[7], are often provided by hospital assets in military systems (Table 11 and 12, Appendix 2). Therefore, the average of 3.77 support staff per provider will be reduced by 32% to 2.56 support personnel per provider. This 2.56 figure per provider includes:

14.9% in the administration support category ("general administrative" and "other administrative support") or, .38 FTE of the 2.56 FTE support staff.
46.5% in the clinical support category (registered nurses, LPNs, medical assistants) for an equivalent of 1.19 FTE of the 2.56 FTE support staff
38.6% in the clinical administration support (medical receptionists, medical secretaries/transcribers, medical records and "other medical support services") to account for .99 FTE of the 2.56 FTE support

This 2.56 total support staff per provider will be used for all providers, as the productivity of NPPs are calculated at the same rate as physicians thus necessitating the same staffing support.

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Panel Size

Introduction

In a capitated care system such as TRICARE, patients are assigned to a provider who is responsible for the patient's primary care needs. The size of the provider's panel, or the number of patient's he can care for, varies depending on several factors to include the case-mix of the enrollees (and subsequent demand) and the productivity of the provider (Hart et al. 1997). These issues will be discussed in greater detail in the following research results on varying panel sizes.

Military Panel Size

Madigan Army Medical Center, a site implementing TRICARE for approximately two years, initially enrolled approximately 1,043 individuals per provider to their family practice clinic providers. However, about 30% of these individuals were retirees, a more resource and time-intensive population group. Their internal medicine adult primary clinic enrolled more patients per provider (1,275 per provider) since there was a 5% reduction in the number of retirees per provider, thus a less intensive case mix (Evans 1996).

Civilian Panel Size

Literature Results

A recent study by Hart et al. (1997) of two staff-model HMOs representing over 600,000 lives found the enrollee per provider ratios to be 78.2 primary care physicians and 15.5 NPPs per 100,000 enrollees resulting in a 1,067 enrollee to provider ratio. Dial et al's study (1995),

referenced in the review of the literature, reflected a panel size of one practitioner per 1,464 enrollees.

Physician Services Practice Analysis Comparison Report, July-December 1995

This report presents practice statistics from across the United States (Center for Research in Ambulatory Health Care Administration 1996). Thirteen practices indicated their overall provider to patient ratio was 1:1,351.32. Eight practices used as a median staffing ratio 1 NP per 1,558.5 patients and six practices employed (median) 1 PA per 1,211.04 patients.[8]

Bureau of Health Professions Model

The Bureau of Health Professions of the Health Resources and Services Administration contracted for the development of a computerized model for estimating and projecting integrated requirements for primary care physicians, NPs, PAs and certified nurse midwives (CNMs) (Moses and Sekscenski 1996). The model allows the user to conduct a population-specific predication of the effect of time on the beneficiary demand for these providers in different managed care scenarios. The data used in the model represents an extensive review of the literature and current practices. Within an urban staff HMO, the baseline set of staffing ratios per 100,000 enrollees is: 84 physicians, 5.5 PAs, 12 NPs and 1.9 certified nurse midwives, equal to about one provider per 967 enrollees.

The average panel size of primary care providers, as calculated from the references immediately above, is 1,194.5 individuals per provider (Appendix 2, Table 13).

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Staffing Requirements for JHD Clinic

Based on Demand and Supply

In designing a template for staffing, the mix of providers needs to be addressed. The following results will present research addressing the use of NPPs in providing primary care and as part of a primary care team. Using this team approach, the staffing for the JHD clinic will be calculated based on the productivity and demand statistics presented previously. The MEDCOM benchmarking staffing results will also be presented.

NPP to Physician Ratio

Prior to determining the staffing requirements based on demand, the mix of physicians to NPPs needs to be determined. One important consideration in this issue is the ability of NPPs to treat primary care patients. NPPs are able to treat approximately 80% of patients seen in ambulatory care settings (Jones and Cawley 1994; Fitzgerald and Jones 1995) with similar ratings of member satisfaction (American Academy of Physician Assistants, ND) and quality outcomes (Hooker and Freeborn, 1991). In Kaiser Permanente Northwest Region's study of PAs, NPs, and physicians, patient satisfaction between the types of providers compared to within two percentage points with a corresponding technical skill comparability within four percentage points (Hooker 1993).

From strictly a cost perspective, the employment of NPPs is more beneficial to a managed care organization. Their salaries are lower: in 1992, an average PA/NP salary was $44,000-52,000 as compared to a family practitioner's salary of $72,000-118,000 (Hooker 1993). In the area of practice costs, there appears to be no statistical difference between

prescribing rates and treatments by type of provider (a practice which could increase the "cost" of employment of the NPP) (Hooker 1993). Training costs of NPPs are also significantly less than physicians. For example, the cost of a PA's two year training in 1992 was $17,500 as compared to a physician's eight years of training costing $80,000 (Hooker 1993). An Air Force study determined that when such cost elements as salary, allowances, bonus pay, procurement costs, retirement and practice costs were collectively analyzed, a PA to MD cost ratio was 0.7 (Buchanan and Hosek 1983). Productivity studies have shown that the time a physician spends supervising the NP or PA reduces the number of patients the physician can see (Mendenhall, Repicky, and Neville 1980). However, hiring an NP/PA increases a practice's total output and costs less than employing an additional physician (Office of Technology Assessment 1986). Thus, NPPs cost less to train and employ, a cost savings which is not offset by a decrease in productivity of the physician supervisors. However, this solely reflects cost from a substitutability perspective. Recent research has evolved which looks at the cost-effectiveness of NPPs from the perspective of a complementary role, contributing to the cost-effectiveness of managed care approaches to patient care (discussed in more depth in the conclusion section).

One limiting factor in the cost-effectiveness of NPPs from a substitutability perspective is in the area of legal restrictions on practice. An increased number of restrictions on practice privileges relates to lower cost effectiveness. NPs can treat patients under the auspices of their nursing license and thus there is less restriction on their practice as compared to a PA who is not an independent practitioner. For example, in North Carolina only two PAs at one time can be supervised by a physician as compared to an unlimited number of NPs (Stanley 1996). In addition, NPs characteristically have more independence in prescription writing than PAs. As

the legal ability of NPPs increases so, too, will the substitution ability (Moses and Sekscenski 1996) and thus potentially productivity.

In the military, Army Regulation 40-48, *Nonphysician Health Care Providers,* dated 1 August 1995, does not delineate a standard or restriction as to physician supervisory ratios for NPs and PAs or limitations on practice beyond the scope of practice of the certification/licensure level. Therefore, legal issues concerning ratios and practice patterns should not be a limiting factor in determining the most efficient and effective provider mix in military treatment facilities. Subsequently, for this study, regulatory legal restrictions will not be a constraint.

The issue of interchangeability of NPs and PAs must also be addressed. Research has shown that NPs focus more on patient education, family counseling and health promotion activities as compared to PAs (Mendenhall, Repicky and Neville 1980; Office of Technology Assessment 1986; Hooker and Freeborn 1991). However, educational preparation and skill capability allow them to be interchangeable in managed care organizations and ambulatory settings (Office of Technology Assessment 1986; Jones and Cawley 1994). For example, a Primary Care Demonstration Project completed in January, 1996 by Mark, Mays, and Byers of selected military primary care sites found that although NPs and PAs characteristically saw specific types of clients, they "appear to be interchangeable in primary care clinics"(Mark, Mays, and Byers 1996). Army regulation 40-48, *Nonphysician Health Care Providers,* designates comparable privileges and duties for patient care of NPs and PAs. Therefore, NPs and PAs will be used interchangeably in this analysis.

Industry standards vary as to the ratio of NPPs to physicians. For example, a Fayetteville family practice employs 2 physician assistants and 4.5 physicians for a ratio of 0.44 NPPs per physician. Forty-six practices responding to *Cost Survey: 1996 Report Based on 1995 Data* indicate a 0.25 midlevel provider (NPs, PAs, and nurse midwives) to primary care physician ratio. Practices with capitation contract revenue of 51-100% reported 0.12 midlevel providers to each physician (Appendix 2, Table 14).[9]

The study by Mark, Mays and Byers (1996) of selected primary care sites in the Army found, at that time, that the ratio of NPPs to physicians varied from 0.4 to 2.0 (Appendix 2, Table 15).

The Bureau of Health Profession's model (referenced previously) for staffing of primary care physicians, NPs, PAs, and CNMs addresses the appropriate mix of providers. Due to the complications in comparing productivity between NPs, PAs and physicians, the model elected to use a substitutability factor (based on a review of the literature and practices) of 0.4 rather than a patients per hour figure. The model calculates the necessary staffing of physicians and NPPs based on this substitutability factor for different healthcare scenarios. Several additional studies conducted in the 1980s reflect a 0.5 to 0.8 substitutability ratio of NPPs to physicians with HMO standards close to 0.8 (Record 1981). Thus, it appears that a ratio of .5 NPPs per one physician (all FTE) is an acceptable industry standard for substitutability and will subsequently be used as a ratio in this analysis.

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Calculation of Staffing for JHD Clinic

Team Approach

Calculations of JHD clinic's staffing model will be based on a "team" of one physician and two NPPs. The team approach is beneficial for several reasons. Patient needs can be divided based on the expertise and specialty of the practitioners, with the "complementary" roles of NPPs and their substitutability roles being maximized. Managed care approaches within a team context facilitates collaboration and subsequent familiarity with the patients should a practitioner not be available. And finally, the supervising role of the physician may be alleviated as familiarity with the practitioners in the team increases.

Available Hours

According to the Center For Health Policy Research's study of 493 practices (1994), the total hours involved in professional activities for general/family practice physicians averaged 56 hours a week of which 35 hours per week were invested in clinic patient care (excludes telephone calls, consults, and care at sites such as emergency rooms and inpatient facilities). The average weeks of practice per year was 48 weeks (1993). Therefore, 35 hours/week for 48 weeks spread over 12 months equals 140 hours per month invested in clinic patient care. The total hour figure used to calculate availability for physicians in the military system is 145 hours per month (Delaney 1996). Subtracting hours for military demands, administration, leave, continuing education and inpatient care, 109.04 hours are available for clinic patient primary care at TMC 21 (COSCOM) and 128.17 hours at TMC 22 (Aviation Clinic) (Manpower Division 1994). Therefore, an availability factor of 140 hours per month for civilian family

practice physicians and 118.6 per month for military physicians (an average of TMC 21 and TMC 22's available hours) will be used in the staffing calculations.

Current Staffing Structure Limitations

As previously discussed, if the ten military providers at the JHD clinic maintained the current productivity, only 6,515 of the targeted 26,231 beneficiaries would be allowed to enroll (thus not all of the targeted 8,100 active duty could enroll), loosing 19,716 beneficiaries. If these ten positions were staffed by civilian providers with a productivity of 2.9 patients per hour at 140 hours per month, these providers could accommodate 48,720 appointments a year. Thus, 11,168 individuals could enroll (all the active duty and 3,068 of the 10,631 family members; no retirees), loosing 15,063 beneficiaries. As compared to the loss of 19,716 beneficiaries with the current military productivity, this is a better staffing structure but certainly does not meet the demand of the population targeted to be enrolled at the JHD clinic under TRICARE. The following presents results of combining anticipated demand with supply issues to determine the needed providers and the most competitive staffing structure to enroll the projected number of 26,231 beneficiaries.

Process for Calculating Staffing Structures

The process used for calculating staffing structures to meet the anticipated demand of the enrolled population was:

Appendix 2, Table 16: Top Section - Patient Demand

Step One: Yearly patient demand per category (active duty, active duty family members, retirees, and retiree family members) was multiplied by the

anticipated enrolled population and added together to obtain the anticipated visits per year

Appendix 2, Table 16: Middle Section - Provider Productivity

Step Two: Provider productivity statistics of patients treated per hour were multiplied by the available hours per month to get available patient appointments per month

Step Three: The available patient appointments per month for a physician and two NPPs were added and multiplied by 12 to derive available appointments per year

Appendix 2, Table 16: Bottom Section - Staff Required

Step Four: The staff required was obtained by dividing the required appointments from step one by the team productivity from step three to yield the number of required teams

Step Five: The required teams were multiplied by 1 physician per team, 1 PA and 1 NP per team to determine the number of required practitioners

Step Six: The total practitioner count was multiplied by 2.56 to determine the support staff needed

Step Seven: The number of practitioners were added to the support staff to determine the required staff for the clinic

Calculation Results

Current Productivity: (Appendix 2, Table 16) Based on TMC 21 and 22's current productivity (1.9 visits per hour for MDs and NPs and 2.25 visits per hour for PAs), to service the 26,231 enrollees a total of 15.4 physicians and 15.4 each PAs and NPs will be required. Added to the support staff requirement of 118.3, the total staffing would be 164.5. This equals a panel size per practitioner of 567.7 enrollees.

Benchmark productivity and military hours: (Appendix 2, Table 17) A benchmark standard of 2.9 visits per hour and the military available hours for clinic patient care (118.6) would yield a need for 10.8 each physicians, PAs and NPs for a panel size of 809.6. Adding the 82.9 required support staff, a total of 115.3 personnel would be needed.

Benchmark productivity and civilian hours: (Appendix 2, Table 18) Using the benchmark standard of 2.9 visits per hour and the average civilian available hour figure of 140 hours per month, there would be a need for 9.1 each physicians, PAs and NPs plus 70.3 support staff for a total of 97.7 personnel. A panel size of 955.7 enrollees per practitioner would result. The most competitive staffing structure based solely on these demand and productivity statistics appears to be this template of providers.

MEDCOM Benchmarking Model Staffing Results

The Manpower Requirements Branch at MEDCOM is developing a second generation model (commonly referred to as the "Benchmarking Model") for determining manpower staffing at military treatment facilities (Saffeels and Chavez, 1996). The first generation model "contained flaws in several areas including the development of some of the benchmarks" (Manpower Requirements Branch 1966). This second generation model, called the Medical Planning System (MPS) model, is "highly defensible. A level of performance expectations were developed using civilian physician marketplace productivity statistics coupled with military readiness and relative values for surgery, medical procedures, ward rounds, and military/administrative essential functions. Support personnel requirements were designed around civilian and historical military staffing patterns in the various clinical operations"

(Manpower Requirements Branch 1996). The new model, as of this publication, is still in the test phase.

The MPS model calculates provider (physicians, NPs and PAs; the model does not differentiate between the type of provider) and support personnel (medical and administrative support) requirements. The MPF, referenced previously, is a factor which is a planning time taking this civilian productivity standard and altering it to take into account non-patient time such as that invested in meetings, administrative tasks, and educational requirements to produce an expected time per patient per specialty. This MPF is multiplied with the monthly clinic workload to produce a "provider yield". Additional provider time required due to readiness demands are addressed under a separate calculation. Support personnel ratios are adjusted by their readiness demands and multiplied with the provider yield (total number of providers "earned") to determine a support personnel yield. The total FTEs earned represent a summary of the earned providers, earned support personnel, and site-specific added personnel such as advice nurses.

A demand figure of 133,725 visits per year (calculated previously for the 120,000 enrollees) or 11,144 visits per month and a readiness figure of 7.28 hours per month for providers (an average of TMC 21 and TMC 22's readiness figures as determined by the Manpower Assessment Team, Manpower Division 1994) was input into MEDCOM's tentative requirement model. The resulting primary care staffing requirements calculated with the model was 26.03 providers and 35.63 support personnel for a total of 61.66 personnel. This results in a panel size of 1,008 enrollees per practitioner. If readiness demands of support personnel parallel

CHAPTER 4

DISCUSSION

Based on the results documented thus far, to service the capitated population of 26,231 with an active duty demand of 4.5 primary care visits PMPY, active duty family member demand of 4.0 visits PMPY and retiree and their family member demand of 7.3 visits PMPY, the most competitive staffing structure appears to be 9.1 each physicians, PAs and NPs working the benchmark productivity of 2.9 visits per hour and the average civilian availability hour figure of 140 hours per month. This results in a panel size of one practitioner to 956 enrollees. They are supported by a staff of 82.9 individuals.

However, local productivity standards are 3.75 patients per hour with the practitioner working 140 hours a month. To be competitive in the local area using these figures, the resulting staffing structure needs to be 6.6 each physicians, NPs and PAs working 140 hours a month providing 4 visits per hour. This is accomplished with a support staff of 50.9 individuals. The resulting panel size would be one provider to 1,318 enrollees.

In a capitated environment the organization is paid for the number of enrollees it serves. Thus, increasing panel size subsequently leads to an increased enrollment financial base. The 956 panel size using the benchmark productivity and civilian available hours is not competitive with the calculated local panel size of 1,318 enrollees per provider. The system with a panel

size per practitioner of 956 needs to increase this panel size to stay competitive. There are four basic ways to achieve the development of an increased panel size in the capitated managed care environment: increase the hour availability of the practitioners, increase their hourly productivity, implement alternate mechanisms for meeting patient demand, or decrease patient demand. All of these mechanisms would allow for a higher provider to enrollee ratio.

Increasing the hour availability for military providers (even though not an issue in the example provided) is critical. An active duty practitioner investing only 118.6 hours per month, or approximately 27 hours a week in patient care is very constrained in the patient panel he can accommodate. For example, based on a 140 hour month (civilian average) instead of a 118.6 hour month (JHD clinic average), using the same demand (133,725 visits total) and hourly productivity statistics (2.9 patients per hour), the panel size increases by 146.1 patients. Thus, increasing productivity by hour availability is one mechanism for enlarging panel size.

Increasing the hourly productivity of the providers also increases panel size. Incentives for increasing productivity are critical. The majority of the providers in the military health care system are military, thus necessitating a different approach to incentives as compared to civilian providers. Incentives such as additional educational funding and equipment funding might enhance productivity. In addition, as has been reflected throughout this analysis, having an adequate support structure is critical for productivity. For example, a local Fayetteville practice supports each provider with three exam rooms, an office, and his own nurse in addition to a full compliment of business, lab and x-ray support. Providers who have to perform aide functions and/or wait in between patients due to room unavailability become severely hindered in their ability to be productive. Immediate dictation/transcription of the encounter is another support

structure mechanism for saving provider time. Thus a combination of incentives for providers and an adequate support structure would potentially increase provider productivity, thus increasing panel size. Using the study's productivity of 2.9 patients per hour and a 140 hour month, increasing provider productivity by 10% (to 3.19 patients per hour) would result in a need for 2.4 fewer providers with a resulting panel size of 1:1,051, a 95.3 enrollee increase per provider.

In addition, implementing alternate mechanisms for meeting patient demand would increase provider panel size. Using non-provider personnel (RNs, LPNs) to monitor and follow-up patients for disease management within their scope of practice would alleviate the demand for MD, PA, and NP provider services. For example, using a team of nurses to manage diabetic patients with back-up support by providers would potentially decrease the required visits to the providers. Thus, the providers' panel size could be increased.

Finally, decreasing patient demand is another approach to increasing panel size. A thorough utilization management program which addresses both provider-induced demand and patient-induced demand is critical. Visits decrease through such mechanisms as gatekeeping, protocols, clinical pathways, nurse advice lines supported by computer-assisted medical decision support systems, health promotion and wellness interventions, early detection and treatment of diseases (Wolcott 1995), and incentives for the patient for managing his health (ie a reduction in premiums). Decreasing the demand of JHD clinic's population by 10% while maintaining a practitioner productivity of 2.9 patients per hour for a 140 hour work month would decrease the number of providers needed by 2.7 providers, increasing the panel size to 1,062, a 106.2 enrollee increase per provider.

Combining these approaches to increasing panel size with a resulting potential increase in provider productivity by 10% and a decrease enrollee demand by 10%, 4.9 fewer providers would be required resulting in a panel size of 1,168 enrollees per provider (an increase of 212.3 lives per provider). These statistics are reflected in Appendix 2, Table 19.

Some systems set goals for enrollment for their providers. These systems need to conduct a thorough analysis as to how these goals can be met with the current productivity and demand statistics. For example, based on the results of this investigation documented previously, to come close to a target of 1 primary care practitioner to 1500 enrollees (a goal set at some military treatment facilities), provider productivity would have to be increased 20% to 3.4 patients per hour and demand decreased 20%, resulting in a panel size of 1,433 patients per provider. How the system can support these aggressive changes in supply and demand must be carefully evaluated. A planned strategic approach utilizing the methods for increasing panel size presented previously would subsequently need to be considered.

One critical element to the success of a capitated system of managed care is a thorough, comprehensive system of evaluation and information management. The impact of mechanisms to decrease demand and increase supply while maintaining quality need to be aggressively monitored through systems accessible and understandable to practitioners and support personnel.

CHAPTER 5

RECOMMENDATIONS/CONCLUSION

The purpose of this study was to determine the most competitive staffing structure for the medical component of the JHD clinic under the TRICARE system of managed care as it served the proposed capitated population. The recommendation for this staffing structure as determined from the supply and demand statistics resulting from this study is 19.9 providers, 1/3 each of physicians, NPs and PAs supported by 2.56 primary care support staff per provider (50.9 total) for a resulting panel size of 1:1,318 (Appendix 2, Table 20 and 21). These providers would need to evaluate 4 patients per hour in a 140 hour month. With this approach, the calculated 133,725 demand visits resulting from a capitated population of 26,231 could be accommodated.

However, military providers, on the average, have readiness demands and are therefore not available the same number of hours to treat patients as their civilian counterparts, thus decreasing the number of available appointment slots and subsequently their panel size. A 140 hour work month does not provide for military-unique time commitments on the part of the providers. Thus, an all civilian staff working this 140 hour work month would be required [or military personnel working 140 hours a month in addition to the time required for military needs (which may be unrealistic)]. However, an all civilian staff would not address the military-unique needs of the active duty patients. Subsequently, a minimum number of military health care

providers may be required. It is up to the command structure to determine the affordable trade-off between addressing military-unique needs with active duty providers versus utilizing civilian health care providers working more hours.

In order to succeed in the future, the military health care system has to be competitive with the civilian health care system while maintaining a high level of quality. This involves an aggressive, efficient and effective approach to managing and providing for patient demand. It necessitates intensely focusing on mechanisms to increase provider productivity and decrease patient demand, thus increasing the providers' panel size. As the provision of healthcare becomes more competitive, increasing panel sizes with additional capitated lives will be a major element to a system's success.

Restructuring the system to accomplish these goals in caring for a capitated population must be conducted with caution. To arrive at this endpoint, an in-depth business process reengineering project to look at processes of care and/or conducting an analysis to look at provider productivity, alternate supply strategies, demand management strategies, and varying the type of support personnel may need to be pursued. This should occur in a team approach with multidisciplinary representation.

Future studies should focus on analyzing productivity and demand management strategics from a cost perspective. Future studies should also focus on conducting an in-depth analysis of the actual costs of providing primary care, the differences in costs between practitioners, and the effects of methods to reduce cost and variability. Costs of prescribing patterns and labs ordered (provider profiling issues) should be evaluated within the context of

treatment patterns (critical pathways, protocols) and provider cost (salary, training, support, etc) to determine cost effectiveness of varying staffing structures and areas for interventions.

The role of NPPs in managed care continues to evolve. Previous studies have concentrated on the substitutability of NPPs for physicians. As managed care emerges, the focus should turn from a substitutability perspective to one evaluating how NPPs can augment the achievement of managed care objectives. Legislative restrictions on the autonomous practice of NPPs should be critically evaluated and addressed. Effectiveness studies should evaluate the impact by NPPs on population-specific health indicators which can subsequently be translated into a monetary figure. However, a word of caution in this approach: the potential for an excess of physicians might lead to less than a full utilization of NPPs in the managed care arena, thus hindering pursuit of the most cost efficient template for providing patient care (Schroeder 1994; Scheffler, Waitzman and Hillman 1996). Managed care administrators should continue to focus on the utilization of the most effective practitioner mix, one which includes a strong focus on NPPs.

It is only through aggressive accountability and management (of issues such as cost, patient demand, and practitioner supply) and innovative approaches to optimal primary patient care that we can begin to succeed in TRICARE. The Joel Health and Dental clinic is just one small part of the military's massive health care structure. However, it exemplifies the turmoil occurring in military medicine today. The military will require a competitive stance toward civilian standards, both in quality patient care and productivity, if it hopes to succeed.

APPENDIX 1: ACRONYMS

AMA	American Medical Association
CHCS	Composite Health Care System
CNM	Certified Nurse Midwife
CRAHCA	Center for Research in Ambulatory Health Care Administration
FTE	Full Time Equivalent
FY	Fiscal Year
HMO	Health Maintenance Organization
JHD	Joel Health & Dental
MAMC	Madigan Army Medical Center
MEDCOM	Medical Command
MEPRS	Medical Expense and Performance Reporting System
MGMA	Medical Group Management Association
MLP	MidLevel Provider (Nurse Practitioners, Physician Assistants, Nurse Midwives)
MPF	Medical Planning Factor
MPS	Medical Planning System
NP	Nurse Practitioner
NPP	Non-Physician Provider

PA	Physician Assistant
PEER	*Performance Efficiency Evaluation Report*
PMPY	Per Member Per Year
RMD	Resource Management Department
TDA	Table of Distribution and Allowances
TMC	Troop Medical Clinic
WAMC	Womack Army Medical Center

APPENDIX 2: TABLES

TABLE 4
HEALTH MAINTENANCE ORGANIZATIONS IN NORTH CAROLINA
UTILIZATION DATA FOR 1995

Health Maintenance Organization	Physician Encounters per 1000 Members	Physician Encounters per Member
Aetna Health Plans of the Carolinas, Inc	4,494	4.49
Blue Cross Blue Shield of NC Line of Business HMO	2,819	2.82
CIGNA Healthcare of NC, Inc.	4,385	4.39
Doctors Health Plan, Inc	3,500	3.5
Healthsource NC, Inc	4,017	4.02
Kaiser Foundation Health Plan of NC	3,045	3.05
Maxicare NC, Inc	3,604	3.6
PARTNERS National Health Plans of NC, Inc	6,458	6.46
Personal Care Plan of NC, Inc	3,758	3.76
PHP, Inc	no report	
Principal Health Care of the Carolinas	4,955	4.96
Provident Health Care Plan Inc of NC	5,029	5.03
Qualchoice of NC, Inc	no report	
WEIGHTED AVERAGE	**4,070**	**4.07**

Source: North Carolina Department of Insurance, Managed Care, and Health Benefits Division. Utilization Data for the Calendar Year 1995. Raleigh, NC, 1996.

TABLE 5
SUMMARY OF PRIMARY CARE PATIENT DEMAND IN CAPITATION ARRANGEMENTS

Source	Visits Per Year
Current:	
MGMA 11-50% cap; (n=13)*	2.96
N.C. HMOs (n=13)	4.07
Medical Group Practice Digest (n=40)	3.78
From Literature:	
Weiner - 1994	4.54
Cerne - 1993	3.03
Stearns & Wolfe - 1992	5.16
Broida et al - 1975	3.69
Military Sites:	
Madigan - Ft.Lewis	4.3 to 4.6
Ft. Polk	9.89
AVERAGE (excluding military sites)	3.89
*Reprinted with permission of the Medical Group Management Association, ,	

TABLE 6
PHYSICIAN PRODUCTIVITY AND SUPPORT PERSONNEL

Category	Number Responses	Mean	Median	Median Monthly
Total Office Visits per Week (1994)				
General/FP	489	104.2	100.0	
South Atlantic	388	74.8	70.0	
Over 8 physician practice	126	74.7	75.0	
Total Office Hours per Week (1994)				
General/FP	493	34.5	35.0	140.0
South Atlantic	392	27.3	30.0	120.0
Over 8 physician practice	128	26.5	28.0	112.0
Total Patients Seen per Hour				
From Two Charts Above				
General/FP		3.0	2.9	
South Atlantic		2.7	2.3	
Over 8 physician practice		2.8	2.7	
Support Personnel per Physician				
Administrative, Secretarial & Clerical (1993)				
General/FP	291		2.0	
South Atlantic	291		2.0	
Over 8 physician practice	244		0.8	
NOTE: The support personnel figures indicated above do not include clinical support personnel				
Source: Center for Health Policy Research. Physician Marketplace Statistics, 1994.				
Edited by Martin L. Gonzalez. Chicago: American Medical Association, 1994.				

TABLE 7

NONSURGICAL ENCOUNTERS PER PROVIDER PER YEAR (1995)

Practice Type	Number of Practices Responding	Median Encounters per Provider
Family Practice	15	4,211.57
Internal Medicine	Unavailable	Unavailable
Pediatrics	Unavailable	Unavailable
Better performing multispecialty practices with capitation	18	3,984.25
Multispecialty practices in eastern region	17	3,745.00
Multispecialty practices with 11-25 FTE physicians	Unavailable	4,568.78
Practices with capitation contract revenue 51-100%	Unavailable	Unavailable
Practices with capitation contract revenue 11-50%	22	3,745.33

TABLE 8

TOTAL SUPPORT STAFF PER PHYSICIAN (ADMINISTRATIVE & CLINICAL) (1995)

Practice Type	Number of Practices Responding	Median Encounters per Provider
Family Practice	78	4.45
Internal Medicine	38	3.75
Pediatrics	26	3.5
Better performing multispecialty practices with capitation	20	4.99
Multispecialty practices in eastern region	65	4.17
Multispecialty practices with 11-25 FTE physicians	100	4.62
Practices with capitation contract revenue 51-100%	30	5.85
Practices with capitation contract revenue 11-50%	95	4.7

TABLE 9
FAMILY PRACTICE SUPPORT STAFF (1995)

Category	Number of Practices Responding	Median Support Personnel
FTE RNs per FTE physician	26	0.38
FTE other nursing staff per FTE physician	27	1.07
Total FTE medical support staff per FTE physician	27	2.52
Total FTE administrative staff per FTE physician	11	0.35
TOTAL FTE support staff per FTE physician	27	3.09

*The samples for each of these categories may vary; thus the medians do not add to the total

TABLE 10

SUMMARY OF MAJOR COMPARABLE FAMILY PRACTICE PRACTITIONER PRODUCTIVITY RESULTS

Source	Patients per Hour	
Current:		
Kaiser Study	3.10	
Nat. Ctr. for Health Policy Research (n=489)	2.90	
Calculated from Cost Survey (n=15)	2.50	
From Literature:		
Hurdle & Pope - 1989	3.00	
Hooker & Freeborn - 1991	3.00	Note: 24 pts/day; 8 hr day
AVERAGE	2.90	

SUMMARY OF MAJOR COMPARABLE FAMILY PRACTICE SUPPORT STAFF RATIOS (ADMINISTRATION & CLINICAL)

Source	Support Staff per Practitioner	
Local	3.85	
Nat. Ctr. for Health Policy Research	2.00	*admin only
PEER Report (n=27 practices)	3.09	
Cost Survey (n=78 practices)	4.45	
AVERAGE of Peer Report and Cost Survey	3.77	

NOTE : Includes all support personnel; military sites may be supported by hospital assets which would decrease support staff.

TABLE 11

FTE SUPPORT STAFF PER PHYSICIAN FOR VARIOUS PRACTICE TYPES

Staff Categories	Family Practice		Internal Medicine		Obstetrics/ Gynecology		Pediatrics		Better Performing Multispecialty Practices with Capitation		Practices with 11-50% Capitation		Practices with 51-100% Capitation		Eastern Section		Practices with 11-35 FTE Physicians	
	Number Responding	Median	Number Responding	Median	Number Responding	Median	Number Responding	Median	Number Responding	Median	Number Responding	Median	Number Responding	Median	Number Responding	Median	Number Responding	Median
TOTAL FTE support staff per FTE physician - general	78	4.46	38	3.73	48	4.12	26	3.80	29	4.90	95	4.70	30	5.85	66	4.17	100	4.62
FTE support staff categories:																		
General administrative	53	0.29	32	0.22	43	0.25	21	0.20	20	0.28	73	0.25	23	0.34	56	0.23	79	0.23
Business office	53	0.73	32	0.60	40	0.74	20	0.48	20	0.67	70	0.64	20	0.54	47	0.66	69	0.71
Managed care administrative	0	*	0	*	0	*	0	*	13	0.06	39	0.16	16	0.29	20	0.10	17	0.12
Information services	11	0.25	0	*	0	*	0	*	16	0.15	48	0.12	19	0.2	22	0.06	36	0.16
Housekeeping/maintenance/security	25	0.25	0	*	15	0.13	0	*	16	0.17	48	0.13	20	0.13	32	0.14	42	0.15
Other administrative support	11	0.29	10	0.30	0	*	10	0.14	16	0.05	45	0.09	10	0.13	23	0.09	37	0.12
Registered nurses	36	0.62	24	0.53	38	0.73	21	0.62	19	0.55	66	0.55	19	0.46	50	0.42	70	0.41
LPNs, medical assistants, etc	56	1.19	30	0.76	40	1.00	20	0.96	19	1.01	71	0.85	20	1.06	55	0.86	76	1.01
Medical receptionists	62	0.88	30	0.67	40	0.83	20	0.66	20	0.66	68	0.8	23	0.91	50	0.81	73	0.81
Med secretaries/transcribers	40	0.29	21	0.33	31	0.25	0	*	16	0.26	63	0.26	16	0.23	47	0.26	59	0.25
Medical records	35	0.33	25	0.37	30	0.31	0	*	20	0.41	63	0.37	21	0.47	43	0.32	63	0.36
Clinical laboratory	34	0.35	27	0.36	20	0.44	0	*	18	0.34	54	0.3	21	0.32	41	0.34	53	0.39
Radiology/imaging	29	0.25	16	0.21	24	0.20	0	*	18	0.19	58	0.22	22	0.27	36	0.17	59	0.23
Physical therapy	0	*	0	*	0	*	0	*	0	*	14	0.06	0	*	0	*	0	*
Optical	0	*	0	*	0	*	0	*	0	*	24	0.04	11	0.09	0	*	13	0.09
Ambulatory surgery unit	0	*	0	*	0	*	0	*	0	*	0	*	0	*	0	*	0	*
Other medical support service	0	*	10	0.17	0	*	0	*	14	0.06	36	0.22	16	0.28	24	0.12	28	0.14
TOTAL median FTE support staff of categories		5.72		4.64		4.88		3.96		4.90		5.06		5.72		4.62		5.17

NOTE: * Indicate less than 10 practices responded; therefore the data is not reported

TABLE 12

FTE SUPPORT STAFF PER PHYSICIAN FOR VARIOUS PRACTICE TYPES

REDUCED FOR CLINIC COMPARISON

	Family Practice	Internal Medicine	Obstetrics/ Gynecology	Pediatrics	Better Performing Multispecialty Practices with Capitation	Practices with 11-50% Capitation	Practices with 51-100% Capitation	Eastern Section	Practices with 11-25 FTE Physicians
	Median	Median	Median	Median	Median	Median	Median	Median	Median
TOTAL FTE support staff per FTE physician- general	**4.45**	**3.73**	**4.12**	**3.50**	**4.99**	**4.70**	**5.85**	**4.17**	**4.62**
FTE Support Staff Categories:									
General administrative	0.29	0.22	0.25	0.20	0.28	0.25	0.34	0.23	0.23
Managed care administrative	*	*	*	*	0.06	0.16	0.29	0.10	0.12
Business office	0.73	0.60	0.74	0.48	0.67	0.64	0.54	0.66	0.71
Information services	0.25	*	*	*	0.15	0.12	0.2	0.08	0.16
Housekeeping/maintenance/security	0.25	*	0.13	*	0.17	0.13	0.13	0.14	0.15
Other administrative support	0.29	0.30	*	0.14	0.05	0.09	0.13	0.09	0.12
Registered nurses	0.62	0.53	0.73	0.62	0.55	0.55	0.46	0.42	0.41
LPNs, medical assistants, etc	1.19	0.78	1.00	0.96	1.01	0.85	1.08	0.88	1.01
Medical receptionists	0.88	0.67	0.83	0.66	0.66	0.8	0.91	0.81	0.81
Med secretaries/transcribers	0.29	0.33	0.25	*	0.28	0.26	0.23	0.26	0.25
Medical records	0.33	0.37	0.31	*	0.41	0.37	0.47	0.32	0.35
Clinical laboratory	0.35	0.36	0.44	*	0.34	0.3	0.32	0.34	0.39
Radiology/imaging	0.25	0.21	0.20	*	0.19	0.22	0.27	0.17	0.23
Physical therapy	*	*	*	*	*	0.06	*	*	*
Optical	*	*	*	*	*	0.04	0.09	*	0.09
Ambulatory surgery unit	*	*	*	*	*	*	*	*	*
Other medical support service	*	0.17	*	*	0.08	0.22	0.26	0.12	0.14
TOTAL median FTE sup staff of categories	**5.72**	**4.54**	**4.88**	**3.06**	**4.90**	**5.06**	**5.72**	**4.62**	**5.17**
NOTE: * indicate less than 10 practices responded; therefore the data is not reported									
Shaded area = staff possibly not utilized in military clinics									
FTE sum of shaded areas: Bus Off; Info; Housekeeping; Lab; Radiology; PT, Optical, ASU	1.83	1.17	1.51	0.48	1.52	1.51	1.55	1.39	1.73
Percentage of shaded areas: Bus Off; Info; Housekeeping; Lab; Radiology; PT, Optical, ASU	32.0%	25.8%	30.9%	15.7%	31.0%	29.8%	27.1%	30.1%	33.5%
NOTE: * indicate less than 10 practices responded; therefore the data is not reported									

TABLE 13
SUMMARY OF PANEL SIZE FOR PRIMARY CARE PROVIDERS

Source	Patients per Provider
Current Surveys and Models:	
PSPA Comparison Report (n=13)*	1351
Bureau of Health Professions Model (400 references)	967
From Literature:	
Hart - 1997	1067
Dial - 1995	1464
Military Sites:	
Madigan - Ft. Lewis, PC Site	1043
Madigan - Ft. Lewis, Internal Med	1275
AVERAGE	1195

TABLE 14

PRIMARY CARE MID-LEVEL PROVIDER PER PHYSICIAN (1995)

Practice Type	Number of Practices Responding	Median MLP* Per Physician
Family Practice	46	0.25
Internal Medicine	14	0.19
Pediatrics	Unavailable	Unavailable
Better performing multispecialty practices with capitation	18	0.06
Multispecialty practices in eastern region	40	0.17
Multispecialty practices with 11-25 FTE physicians	57	0.13
Practices with capitation contract revenue 51-100%	20	0.11
Practices with capitation contract revenue 11-50%	63	0.12

MLP = MidLevel Providers (NPs, PAs, and Midwives)

TABLE 15
NONPHYSICIAN PROVIDERS PER PHYSICIAN (1996)

	NonPhysician Providers			
Clinic	NPs	PAs	MDs	Ratio of NPPs to MDs
Clinic #1*	4	1	12	0.4 to 1
Clinic #2	2	1	3	1 to 1
Clinic #3	2	4	3	2 to 1
Clinic #4	1	3	6	0.7 to 1
Clinic #5	4	0	9	0.4 to 1
Clinic #6	3	1	6	0.7 to 1
Clinic #7	2	4	3	2 to 1
Clinic #8	3	16	10	1.9 to 1
Clinic #9	4	2	4	1.5 to 1

*This clinic also employed residents who were not incorporated into the calculations

Source: Mark, Debra, Mary Mays and Vicki Byers. "After Action Report: Analysis of Patterns of Practice by Type of Primary Care Provider." San Antonio, Texas, 7 February, 1996.

TABLE 16
JOEL HEALTH AND DENTAL CLINIC
PRIMARY CARE STAFFING REQUIREMENTS BASED ON CURRENT PRODUCTIVITY AT TMCs 21 & 22

NOTE: White cells are data input cells; shaded cells are the results

Analysis Date: April 30, 1997

PATIENT DEMAND

Patient Category	Enrollment	Demand Ratio Visits/Yr	Visits Per Year
	a	b	a x b = c
Active Duty	8100	4.5	36450.0
AD Family Members	10631	4.0	42525.0
Retirees & Fam Mbrs	7500	7.3	54750.0
TOTAL	26231		133725.0

PROVIDER PRODUCTIVITY

Provider	Number of Provider Type	Productivity Pts/hr	Available Hours Per Mo*	Available Patient Appts Per Mo	Available Appts Per Team Per Year
	a	b	c	a x b x c = d	sum d x 12
TMC 21 & 22:					
Physician	1	1.9	118.6	225.3	
PA	1	2.3	118.6	272.8	
NP	1	1.9	118.6	225.3	
TOTAL					6681.5

*Based on September 1994 Manpower Assessment Team visit, average of TMC 21 and TMC 22

Hours are used versus FTE equivalent for ease of calculation

STAFF REQUIRED

Required Appts	Team Productivity Appts/yr	Required Teams	Providers Required			TOTAL Providers	Support Personnel Per Provider	TOTAL Support Personnel Per Provider	TOTAL Staff	Panel Size Enrollees Per Provider
			Physicians	PA	NP					
a = demand above	b=productivity above	c=a/b	d= 1 ea practitioner per team			e= sum d	f	g=f x 2.56	h=f + g	i
133725.0	6681.5	15.4	15.4	15.4	15.4	46.2	2.56	118.3	164.5	567.7

NOTE: For planning purposes only; not "official"

TABLE 17
JOEL HEALTH AND DENTAL CLINIC
PRIMARY CARE STAFFING REQUIREMENTS BASED ON
BENCHMARK PRODUCTIVITY AND MILITARY AVAILABLE HOURS

NOTE: White cells are data input cells; shaded cells are the results

Analysis Date: April 30, 1997

PATIENT DEMAND

Patient Category	Enrollment	Demand Ratio Visits/Yr	Visits Per Year
	a	b	a x b = c
Active Duty	8100	4.5	36450.0
AD Family Members	10631	4.0	42525.0
Retirees & Fam Mbrs	7500	7.3	54750.0
TOTAL	26231		133725.0

PROVIDER PRODUCTIVITY

Provider	Number of Provider Type	Productivity Pts/hr	Available Hours Per Mo*	Available Patient Appts Per Mo	Available Appts Per Team Per Year
	a	b	c	a x b x c = d	sum d x 12
TMC 21 & 22:					
Physician	1	2.9	118.6	343.9	
PA	1	2.9	118.6	343.9	
NP	1	2.9	118.6	343.9	
TOTAL					12361.8

*Based on September 1994 Manpower Assessment Team visit, average of TMC 21 and TMC 22

Hours are used versus FTE equivalent for ease of calculation

STAFF REQUIRED

Required Appts	Team Productivity Appts/yr	Required Teams	Providers Required: Physicians	PA	NP	TOTAL Providers	Support Personnel Per Provider	TOTAL Support Personnel Per Provider	TOTAL Staff	Panel Size Enrollees Per Provider
a = demand above	b=productivity above	c=a/b	d= 1 ea practitioner per team			e= sum d	f	g=f x 2.56	h=f + g	i
133725.0	12361.8	10.8	10.8	10.8	10.8	32.4	2.56	82.9	115.3	809.6

NOTE: For planning purposes only; not "official"

TABLE 18
JOEL HEALTH AND DENTAL CLINIC
PRIMARY CARE STAFFING REQUIREMENTS BASED ON
BENCHMARK PRODUCTIVITY AND CIVILIAN AVAILABLE HOURS

NOTE: White cells are data input cells; shaded cells are the results

Analysis Date: April 30, 1997

PATIENT DEMAND

Patient Category	Enrollment	Demand Ratio Visits/Yr	Visits Per Year
	a	b	a x b = c
Active Duty	8100	4.5	36450.0
AD Family Members	10631	4.0	42525.0
Retirees & Fam Mbrs	7500	7.3	54750.0
TOTAL	26231		133725.0

PROVIDER PRODUCTIVITY

PROVIDER	Number of Provider Type	Productivity Pts/hr	Available Hours Per Mo*	Available Patient Appts Per Mo	Available Appts Per Team Per Year
	a	b	c	a x b x c = d	sum d x 12
TMC 21 & 22:					
Physician	1	2.9	140.0	406.0	
PA	1	2.9	140.0	406.0	
NP	1	2.9	140.0	406.0	
TOTAL					14616.0

*Source: Center for Health Policy Research. Physician Marketplace Statistics, 1994. Edited by Martin L. Gonzalez. Chicago: American Medical Association, 1994.

Hours are used versus FTE equivalent for ease of calculation

STAFF REQUIRED

Required Appts	Team Productivity Appts/yr	Required Teams	Providers Required Physicians	PA	NP	TOTAL Providers	Support Personnel Per Provider	TOTAL Support Personnel Per Provider	TOTAL Staff	Panel Size Enrollees Per Provider
a = demand above	b=productivity above	c=a/b	d= 1 ea practitioner per team			e= sum d	f	g=f x 2.56	h=f + g	i
133725.0	14616.0	9.1	9.1	9.1	9.1	27.4	2.56	70.3	97.7	958.7

NOTE: For planning purposes only; not "official"

TABLE 19
JOEL HEALTH AND DENTAL CLINIC
PRIMARY CARE STAFFING REQUIREMENTS BASED ON
BENCHMARK PRODUCTIVITY AND CIVILIAN AVAILABLE HOURS
WITH 10% INCREASE IN PRODUCTIVITY & 10% DECREASE IN DEMAND

NOTE: White cells are data input cells; shaded cells are the results

Analysis Date: April 30, 1997

PATIENT DEMAND

Patient Category	Enrollment	Demand Ratio Visits/Yr	Visits Per Year
	a	b	a x b = c
Active Duty	8100	4.1	32805.0
AD Family Members	10631	3.6	38272.5
Retirees & Fam Mbrs	7500	6.6	49275.0
TOTAL	26231		120352.5

PROVIDER PRODUCTIVITY

Provider	Number of Provider Type	Productivity Pts/hr	Available Hours Per Mo*	Available Patient Appts Per Mo	Available Appts Per Team Per Year
	a	b	c	a x b x c = d	sum d x 12
TMC 21 & 22:					
Physician	1	3.19	140	446.6	
PA	1	3.19	140	446.6	
NP	1	3.19	140	446.6	
TOTAL					16077.6

*Source: Center for Health Policy Research. Physician Marketplace Statistics, 1994. Edited by Martin L. Gonzalez. Chicago: American Medical Association, 1994.

Hours are used versus FTE equivalent for ease of calculation

STAFF REQUIRED

Required Appts	Team Productivity Appts/yr	Required Teams	Providers Required: Physicians	PA	NP	TOTAL Providers	Support Personnel Per Provider	TOTAL Support Personnel Per Provider	TOTAL Staff	Panel Size Enrollees Per Provider
a = demand above	b=productivity above	c=a/b	d= 1 ea practitioner per team			e= sum d	f	g=f x 2.56	h=f + g	i
120352.5	16077.6	7.5	7.5	7.5	7.5	22.5	2.56	57.5	79.9	1188.1

NOTE: For planning purposes only; not "official"

TABLE 20
JOEL HEALTH AND DENTAL CLINIC
PROPOSED PRIMARY CARE STAFFING REQUIREMENTS

NOTE: White cells are data input cells; shaded cells are the results

Analysis Date: April 30, 1997

PATIENT DEMAND

Patient Category	Enrollment	Demand Ratio Visits/Yr	Visits Per Year
	a	b	a x b = c
Active Duty	8100	4.5	36450.0
AD Family Members	10631	4.0	42525.0
Retirees & Fam Mbrs	7500	7.3	54750.0
TOTAL	26231		133725.0

PROVIDER PRODUCTIVITY

Provider	Number of Provider Type	Productivity Pts/hr	Available Hours Per Mo*	Available Patient Appts Per Mo	Available Appts Per Team Per Year
	a	b	c	a x b x c = d	sum d x 12
TMC 21 & 22:					
Physician	1	4.0	140.0	560.0	
PA	1	4.0	140.0	560.0	
NP	1	4.0	140.0	560.0	
TOTAL					20160.0

*Source: Center for Health Policy Research. Physician Marketplace Statistics, 1994. Edited by Martin L. Gonzalez. Chicago: American Medical Association, 1994.

Hours are used versus FTE equivalent for ease of calculation

STAFF REQUIRED

Required Appts	Team Productivity Appts/yr	Required Teams	Providers Required Physicians	PA	NP	TOTAL Providers	Support Personnel Per Provider	TOTAL Support Personnel Per Provider	TOTAL Staff	Panel Size Enrollees Per Provider
a = demand above	b=productivity above	c=a/b	d= 1 ea practitioner per team			e= sum d	f	g=f x 2.56	h=f + g	i
133725.0	20160.0	6.6	6.6	6.6	6.6	19.9	2.56	50.9	70.8	1318.2

NOTE: For planning purposes only; not "official"

TABLE 21
PERSONNEL REQUIREMENTS FOR VARYING PRODUCTIVITY & DEMAND

Standards	Physicians	Nurse Practitioners	Physician Assistants	TOTAL Providers	Support Staff	TOTAL Staff	Panel Size
Current productivity	15.4	15.4	15.4	46.2	118.3	164.5	1:567.7
Benchmark productivity (2.9 pts/hr) military hrs (118.6/mo)	10.8	10.8	10.8	32.4	82.9	115.3	1:809.6
Benchmark productivity (2.9 pts/hr) civilian hrs (140/mo)	9.1	9.1	9.1	27.4	70.3	97.7	1:955.7
10% increase in productivity (3.19 pts/hr) 10% decrease in demand	7.5	7.5	7.5	22.5	57.5	79.9	1:1168.1
Proposed productivity (4 pts/hr) civilian hrs (140/mo)	6.6	6.6	6.6	19.9	50.9	70.8	1:1318.2

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